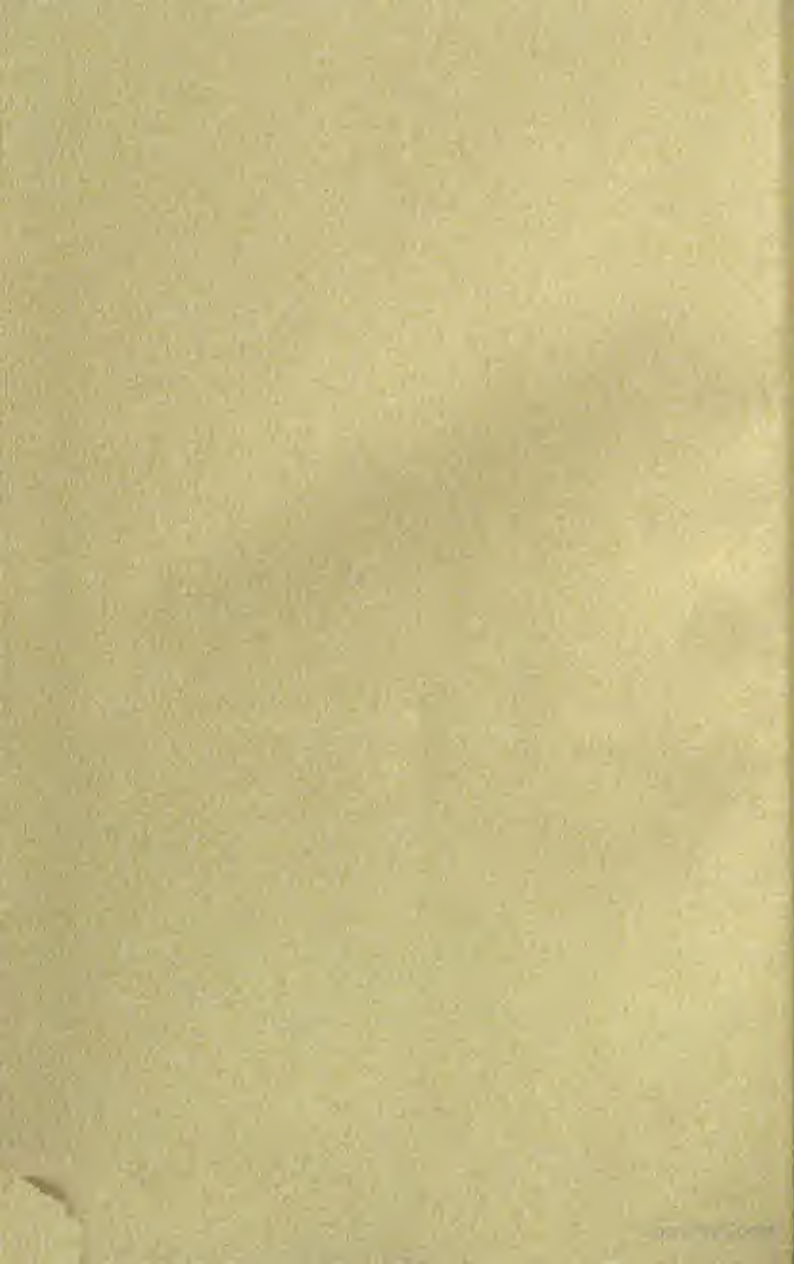


**OFFICIAL  
DESCRIPTIVE  
CATALOGUE  
KINGDOM OF  
ITALY PUBL. BY...**

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INTERNATIONAL EXHIBITION, 1862.

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KINGDOM OF ITALY.

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OFFICIAL DESCRIPTIVE  
CATALOGUE.

PUBLISHED BY ORDER OF  
THE ROYAL ITALIAN COMMISSION.

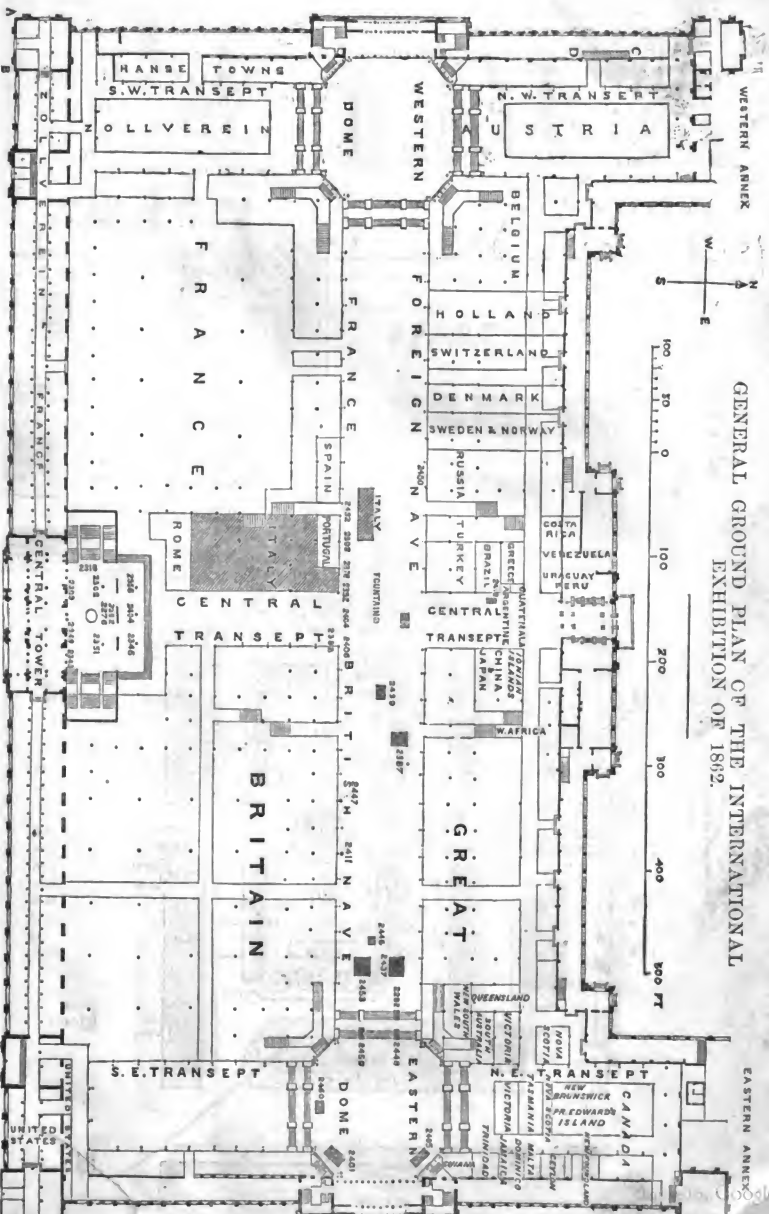


LONDON :

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1862.



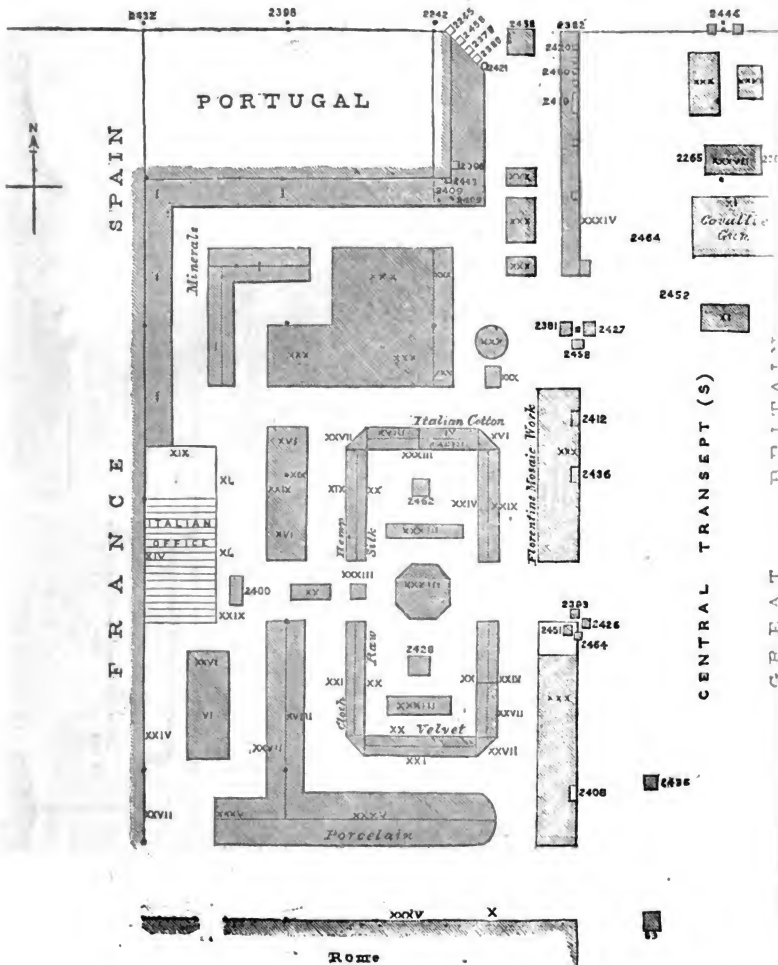


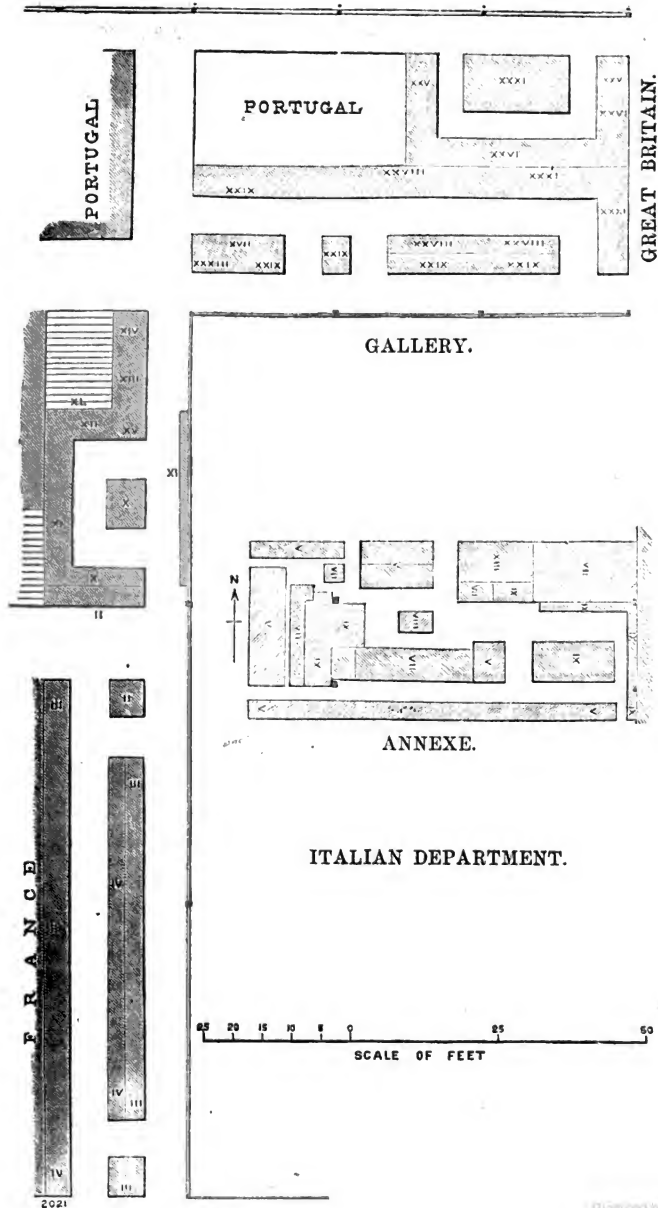


# ITALIAN DEPARTMENT. GROUND PLAN

FOREIGN NAVE

BRITISH NAVE







# INTERNATIONAL EXHIBITION OF 1862.



## KINGDOM OF ITALY,

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The economical condition of Italy is less known than that of any other civilised country. Subdivided hitherto into many petty States, most of them governed despotically; destitute of harbours and railways in many provinces, and her commerce impeded by numerous Custom-house lines in every direction, Italy has not only been unable to develop her natural resources, but has remained almost unknown to herself and to others.

Few countries, however, possess such elements of prosperity as Italy; and, now that she has acquired independence and liberty, there are none to whom more favourable opportunities are afforded for their development. Her geographical position in the Mediterranean, being, throughout her whole length, in the direct route between Western Europe and India, possessing the nearest port of embarkation for Alexandria, and forming, so to speak, a link connecting the more civilised nations of Europe with Asia and Africa, is a circumstance which cannot fail to influence her destinies.

The Royal Commission appointed by the Italian Government to organize and direct the Italian Department of the Exhibition of 1862, did not fail to point out from the commencement the necessity for the New Kingdom to take an important part in this Exhibition, and, while passing in review the productive capabilities of Italy, to profit by this opportunity to show to others what an industrial future is in store for her.

The Royal Commissioners are happy to state that the nation has fully appreciated and heartily responded to the appeal, so much so that the number of Medals and Honourable Mentions awarded by the International Juries to the Italian Exhibitors, has far exceeded that given to any country except England and France. This result derives additional importance from the fact that the greater number of those Prizes have been given for raw materials capable of forming the basis of important manufactures.

In preparing the present DESCRIPTIVE CATALOGUE, the Commission have endeavoured to embody the largest possible amount of information regarding the objects exhibited, convinced that the most urgent necessity of a nation determined to take her proper place in the scale of civilisation is to study and know herself, and to point out to others her present position and the various natural resources at her disposal.

The Royal Commission gladly avail themselves of this opportunity to tender their warmest thanks to all those gentlemen who have co-operated with them with such zeal and self-denial in the laborious and tedious task of compiling this Catalogue.

The Royal Italian Commissioners,

G. DI CAVOUR.

G. DEVINCENZI.

44, Thurloe-square, London.

# INTERNATIONAL EXHIBITION, 1862.



I.

## ROYAL ITALIAN COMMISSION.

---

H.R.H. PRINCE EUGENE OF SAVOY CARIGNAN, *Honorary President.*

Marquis GUSTAVO BENSO DI CAVOUR, M.P., *President.*

Sir JAMES HUDSON, K.C.B., British Minister at Turin.

Cav. R. AUDINOT, M.P.

Commendatore T. CORSI, M.P. (late Minister of Agriculture, Industry, and Commerce).

Cav. G. CURIONI, Secretary to the Lombard Institute.

Commendatore S. JACINI, M.P. (late Minister of Public Works).

Cav. G. LA FARINA, M.P., Councillor of State, late Minister in Sicily.

Count A. NOMIS DI POLLONE, Senator of the Kingdom, Vice-President of the Chamber of Agriculture and Commerce of Turin.

Commendatore R. PIRIA, Senator of the Kingdom (late Minister of Public Instruction in Naples).

His Excellency Marquis C. RIDOLFI, Senator of the Kingdom (late Minister of State in Tuscany, President of the Royal Academy of Georgofili).

Cav. A. SALVAGNOLI MARCHETTI, M.P.

Cav. G. SELLA, Manufacturer.

Marquis V. TORREARSA, M.P., late Minister of State in Sicily.

Cav. P. TORRIGIANI, M.P., late Minister of Public Works in the Emilia.

General Baron P. SOLAROLI, M.P.

THE SECRETARY OF THE MINISTRY OF FINANCE.

THE SECRETARY OF THE MINISTRY OF PUBLIC WORKS.

THE SECRETARY OF THE MINISTRY OF MARINE.

THE SECRETARY OF THE MINISTRY OF AGRICULTURE, INDUSTRY, AND COMMERCE.

Commendatore GIUSEPPE DEVINCENZI, M.P. (late Minister of Agriculture, Commerce, and Public Works at Naples), *Secretary.*

X.

II.

OFFICES OF THE ROYAL ITALIAN COMMISSION  
IN TURIN.

---

CAV. AVV. GIUSEPPE FERRERO, LORENZO LUCHI, Prof. GIUSEPPE MONGERI (for Fine Arts), W. P. JERVIS, Mining Engineer, FILIPPO CALANDRINI, Professor of Botanic Agriculture in the Agricultural Institute of Florence, ALESSANDRO GICCA, Civil Engineer, <i>Collector of Proposal from Sub-Committees, and General Archivist.</i> AVV. LUIGI ARCOZZI-MASINO, <i>Collector of Statistics.</i> Dr. ANSELMO ANSELMi, <i>Head Clerk.</i> GIO. BATTÀ BASEGGIO, <i>Book-keeper.</i>	} <i>Principals.</i>          }	<i>Compilers of the Official Catalogue.</i>
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III.

ROYAL GENERAL COMMISSIONERS  
IN LONDON.

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Marquis GUSTAVO BENSO DI CAVOUR, M.P.  
Commendatore GIUSEPPE DEVINCENZI, M.P.

STAFF.

LORENZO LUCHI, *Secretary.*  
ENRICO GRABAU, *General Superintendent of the Department.*  
GIACINTO BERBUTI, *Assistant to the Gen. Superintendent.*  
Professor EMILIO BURCI, *Special Superintendent for Fine Arts.*  
W. P. JERVIS, *Assistant-General to the Special Commissioners.*

(OFFICES:—44, THURLOE-SQUARE, S.W.)

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IV.

FINANCIAL DEPARTMENT IN LONDON.

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Commendatore EMANUELE MARLIANI, M.P., *Commissioner.*  
GIUSEPPE BOTTA, *Secretary.*

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V.

COMMISSIONERS FOR THE ITALIAN WORKMEN.

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CAV. AVV. TITO MENICCHETTI, M.P.  
CAV. GIO. GIACOMO REYMOND, Professor of Political Economy at the University of Turin.  
ALBERTO ROMANO-RIVERA, Civil Engineer.

# LIST OF ITALIAN JURORS

WHO HAVE TAKEN PART IN THE JURY OF THE INTERNATIONAL EXHIBITION OF 1862.

## SECTION I.

### CLASS I.

MINING, QUARRYING, METALLURGY, AND MINERAL PRODUCTS.

IGINO COCCHI, Professor of Geology at the Royal Museum of Natural History in Florence.

### CLASS II.

CHEMICAL SUBSTANCES AND PRODUCTS, AND PHARMACEUTICAL PROCESSES.

#### SUB-CLASS A.

CHEMICAL PRODUCTS.

Commendatore RAFFAELE PIRIA, Professor of Chemistry at the University of Turin, Senator of the Kingdom, Member of the Royal Commission.

#### SUB-CLASS B.

MEDICAL AND PHARMACEUTICAL PROCESSES.

Commendatore SALVADORE TOMMASI, Professor of Pathology at the University of Pavia.

### CLASS III.

SUBSTANCES USED FOR FOOD.

#### SUB-CLASS A.

AGRICULTURAL PRODUCE.

Commendatore STEFANO JACINI, M.P., Member of the Royal Commission.

#### SUB-CLASS B.

DRYSALTERY, GROCERY, ETC.

ADOLFO TARGIONI-TOZZETTI, Professor of Zoology at the Royal Museum of Natural History in Florence.

#### SUB-CLASS C.

WINES, SPIRITS, BEER AND OTHER DRINKS, AND TOBACCO.

Marquis General EMILIO BERTONE DI SAMBUI, President of the Agricultural Association in Turin.

### CLASS IV.

ANIMAL AND VEGETABLE SUBSTANCES USED IN MANUFACTURES

#### SUB-CLASS A.

OILS, FATS, WAX AND THEIR PRODUCTS.

Commendatore JOHN BENJAMIN HEATH, Italian Consul-General.

#### SUB-CLASS C.

OTHER ANIMAL SUBSTANCES USED IN MANUFACTURES

Cav. FILIPPO PARLATORE, Professor of Botany in the Royal Museum of Natural History in Florence.

## SECTION II.

### CLASS VII.

#### MANUFACTURING MACHINES AND TOOLS.

##### SUB-CLASS B.

##### MACHINES AND TOOLS EMPLOYED IN VARIOUS MANUFACTURES.

Cav. PIETRO CONTI, M.P., Major Royal Engineers, Secretary and Reporter of the International Jury.

### CLASS IX.

#### AGRICULTURAL AND HORTICULTURAL MACHINES AND IMPLEMENTS.

Commendatore GIUSEPPE DEVINCENZI, M.P., Royal General Commissioner.

### CLASS X.

#### CIVIL ENGINEERING, ARCHITECTURAL AND BUILDING CONTRIVANCES.

Cav. CESARE VALERIO, M.P., Civil Engineer.

### CLASS XI.

#### MILITARY ENGINEERING, ARMOUR, AND ACCOUTREMENTS, ORDNANCE, AND SMALL ARMS.

##### SUB-CLASS C.

##### ARMS, ORDNANCE, ETC.

Cav. GIOVANNI CAVALLI, Lt.-General of Artillery.

### CLASS XIII.

#### PHILOSOPHICAL INSTRUMENTS, AND PROCESSES DEPENDING UPON THEIR USE.

Cav. GILBERTO GOVI, Professor of Natural Philosophy at the University of Turin.

## SECTION III.

### CLASS XVIII.

#### COTTON.

Cav. LORENZO CORIANCHI.

### CLASS XIX.

#### FLAX AND HEMP.

Marquis LUIGI CESARI, di Cassano d'Adda.

### CLASS XX.

#### SILKS AND VELVETS.

FILIPPO Sessa, Manufacturer.

### CLASS XXI.

#### WOOLLEN AND WORSTED, INCLUDING MIXED FABRICS.

Cav. GIUSEPPE SELLA.

### CLASS XXVI.

#### LEATHER, INCLUDING SADDLERY AND HARNESS.

##### SUB-CLASS A.

##### LEATHER.

Cav. FRANCESCO SANTIRANA, Major of Cavalry.

### CLASS XXVII.

#### ARTICLES OF CLOTHING.

##### SUB-CLASS C.

##### HOSIERY, GLOVES, AND CLOTHING IN GENERAL.

LUIGI SCALIA, M.P.

CLASS XXVIII.

PAPER, STATIONERY, PRINTING, AND BOOKBINDING.

SUB-CLASS A.

PAPER, CARD AND MILLBOARD.

Cav. BARTOLOMEO CINI, M.P.

SUB-CLASS C.

PLATE, LETTER-PRESS AND OTHER MODES OF PRINTING.

Cav. ANTONIO GALLENGA, M.P.

CLASS XXIX.

SUB-CLASS A.

BOOKS, MAPS, DIAGRAMS, AND GLOBES.

Cav. CELESTINO BIANCHI, late Secretary to the Government in Tuscany.

SUB-CLASS B.

SCHOOL FITTINGS AND FURNITURE.

Marquis GUSTAVO BENSO DI CAVOUR, M.P., President of the Class, and Royal General Commissioner.

CLASS XXX.

FURNITURE, PAPER-HANGING AND DECORATION.

SUB-CLASS A.

FURNITURE AND UPHOLSTERY.

Count DEMETRIO CARLO FINOCCHIETTI, Vice-Governor of the Royal Palaces in Tuscany.

CLASS XXXI.

IRON AND GENERAL HARDWARE.

SUB-CLASS A.

IRON MANUFACTURES.

Cav. GIULIO CURIONI, Secretary to the Lombard Institute, Member of the Royal Commission.

CLASS XXXII.

STEEL, CUTLERY AND EDGE TOOLS.

• SUB-CLASS B.

CUTLERY AND EDGE TOOLS.

Baron CARLO SOBRERO, General of Artillery.

CLASS XXXIII.

WORKS IN PRECIOUS METALS, THEIR IMITATION AND JEWELLERY.

Count LUIGI CORTI, Secretary of the Italian Legation in London, and Vice-President of the Class.

CLASS XXXV.

POTTERY.

Marquis VITTORIO EMANUELE D'AZEGLIO, Envoy Extraordinary and Minister Plenipotentiary of H. M. the King of Italy in London.

## VII.

SPECIAL COMMISSIONERS APPOINTED BY THE ROYAL ITALIAN  
COMMISSION FOR VARIOUS STUDIES AND RESEARCHES.

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## RESOLUTION

PASSED AT FLORENCE ON THE 9TH JULY, 1861.

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"The Royal Commission, in order to become acquainted with the present state, not only of the manufactures which might tend to increase the national prosperity, but also their condition in neighbouring countries, as also to investigate the means by which they may be raised in Italy to their highest degree of perfection, has resolved to confide to SPECIAL COMMISSIONERS the study not only of already existing manufactures, but those towards which the national energies might be advantageously directed.

"These Commissioners will be selected, either from among the members of the Royal Commission, or elsewhere among the most distinguished men of science and manufacturers. From the time of their nomination they will commence their studies of all matters relating to the manufactures of Italy, and subsequently, by the aid of the rich materials with which they will be furnished by the International Exhibition of London, they will be facilitated in drawing up reports on the special branches they shall have studied, which will assist in giving an impulse to our future economical progress.

"The Special Commissioners will, by the medium of the Royal Commission, be put in communication with Sub-Committees to be established in the various provinces of the kingdom, in order to procure from them information on the present condition of our manufactures,

"The Royal Commission believes that these Commissioners will find many materials for their studies in the Italian Exhibition at Florence, and that it would be advisable to hold a meeting, to be convened by the President of the Central Commission, in order to concert the most desirable measures to be taken to advance the manufactures already established, and create new ones, so urgently demanded by the wants of the nation."

G. DI CAVOUR, *President.*

G. DEVINCENZI, *Secretary.*

# LIST OF COMMISSIONERS.

Cav. GIUSEPPE MENEHINI, Professor of Mineralogy and Geology at the University of Pisa ... ..					Special objects of their studies and researches.
Igino COCCHI, Professor of Geology at the Royal Museum of Natural History in Florence ... ..					
Cav. GIULIO CURIONI, Secretary of the Lombard Institute, &c. ... ..					Mining, Quarrying, Metallurgy, and Mineral Products.
Cav. ANGILO VIGNI, Professor of Metallurgy at the Royal Museum of Natural History in Florence ... ..					
ODOARDO KRAMER, Civil Engineer ... ..					Manufactures.
Dr. ANGILO VILLA PERNICE ... ..					Copper and Brass Manufactures.
Commendatore RAFFAELE PIRIA, Professor of Chemistry at the University of Turin, Senator of the Kingdom...					Chemical Substances and Products.
STANISLAO CANNIZARO, Professor of Chemistry at the University of Palermo ... ..					
Cav. SEBASTIANO DE LUCA, Professor of Chemistry at the University of Pisa ... ..					
Commendatore STEFANO JACINI, M.P., &c. ... ..					
Cav. PIETRO TORRIGIANI, M.P., Professor of Political Economy in Parma ... ..					Agriculture.
ANGIOLO PAVESI, Professor of Chemistry at the University of Pavia ... ..					Natural and Artificial Manures.
ADOLFO TARGIONI TOZZETTI, Professor of Zoology at the Royal Museum of Natural History in Florence ... ..					Substances used for food.
Marquis General EMILIO BENTONE di Sambuy ... ..					Wines.
Commendatore J. B. HEATH, Italian Consul-General ... ..					Oils, Fats, and their Products.
Cav. FILIPPO PARLATORE, Professor of Botany at the Royal Museum of Natural History in Florence ... ..					Vegetable Substances used in Manufactures.
Cav. ANTONIO SALVAGNOLI MARCHETTI, M.P. ... ..					Animal Substances used in Manufactures.
Cav. PIETRO CONTI, M.P., Major Royal Engineers, &c. ... ..					Railway Plant, Locomotive Engines and Carriages. Carriages not connected with Rail or Tram-roads. Manufacturing Machines and Tools. Machinery in general.
Commendatore GIUSEPPE DEVINCENZI, M.P., Royal General Commissioner ... ..					Agricultural and Horticultural Machines and Implements.
FILIPPO CALANDRINI, Professor of Botanic Agriculture at the Agronomic Institute in Florence ... ..					Woods and Arboriculture.
Cav. FRANCESCO DEL GIUDICE. ... ..					Apparatus used in the Preparation of Hemp and Flax. Ornamental Architecture and Building in general.
ANTONIO GABRIELLI ... ..					Machinery applied to Naval Engineering.

				Special objects of their studies and researches.
Cav. CESARE VALERIO, M.P., Civil Engineer	...	...	...	...Docks.
Cav. GIOVANNI CAVALLI, Lieutenant-General of Artillery	{ Military Engineering, Armour, and Accoutrements.			
General NINO BIXIO, M.P.	...	...	...	...Mercantile Navy.
Cav. GILBERTO GOVI, Professor of Natural Philosophy at the University of Turin	...	...	...	{ Philosophical Instruments.
Cav. LORENZO COBIANCHI	...	...	...	...Cotton.
Marquis LUIGI CUSANI di Cassano d'Adda	...	...	...	{ Flax and Hemp.
FRANCESCO LUIGI BOTTER, Professor of Agriculture at Bologna	...	...	...	
FILIPPO SESSA, Manufacturer	...	...	...	...Silks.
Cav. GIACOMO CHICHIZOLA, Manufacturer	...	...	...	...Velvets.
Cav. FRANCESCO SARTIRANA, Major of Cavalry	...	...	...	{ Leather, Skins, Saddlery, and Harness.
GIACOMO ARNAUDON, Professor at the Istituto Tecnico in Turin	...	...	...	
Cav. BARTOLOMMEO CINI, M.P.	...	...	...	{ Paper Manufacture.
CARLO AVONDO, Manufacturer...	...	...	...	
Marquis GUSTAVO BENSO DI CAVOUR	...	...	...	{ General Education.
Cav. CELESTINO BIANCHI	...	...	...	
Cav. PASQUALE VILLARI, Professor of History	...	...	...	
Commendatore SALVADORE TOMMASI, Professor of Pathology at the University of Pavia	...	...	...	{ Scientific Education and Sanitary Institutions.
MAURO MACCHI, M.P.	...	...	...	{ Industrial Schools attached to Benevolent Institutions.
CARLO MORELLI, Professor of the History of Medicine in Florence	...	...	...	{ Health of Towns.
Cav. SPIRITO NOMIS DI POLLONE	...	...	...	
COUNT DEMETRIO CARLO FINOCCHIETTI	...	...	...	{ Furniture, Mosaics, Works in Wood and Ivory, <i>Marquetry</i> , Carving, and Upholstery.
Baron CARLO SOBRERO, General of Artillery	...	...	...	...Steel and Edge Tools.
Commendatore TOMMASO CORSI, M.P., &c.	...	...	...	{ Coinage, Works in Precious Metals and their Imitations, and Jewellery.
Cav. ASCANIO SOBRERO, Professor of Chemistry at Turin	...	...	...	...Glass Manufacture.
Cav. GIULIO RICHARD, Manufacturer	...	...	...	...Manufacture of Pottery.
Commendatore GIUSEPPE MARTELLI, Director of Architectural Works and Government Establishments in Tuscany	...	...	...	{ Architecture and Fine Arts in general.

## VIII.

## PROVINCIAL AND LOCAL SUB-COMMITTEES.

In every province, and in many of the principal centres of industry, there are Sub-Committees appointed for organising the industrial sections of the Exhibition. Besides these, there are ten special Fine Art Sub-Committees in Italy, and one in London. For lists of members, see *Atti Ufficiali del Real Comitato Centrale Italiano, Torino*.

## IX.

## COMMISSIONERS

*Appointed to co-operate with the Royal Commission and the Sub-Committees for organising the Exhibition, and for the compilation of the Descriptive Catalogue.*

CLASS I.	Cav. GIULIO CURIONI, Secretary of the Lombard Institute.
"	Prof. IGINO COCCHI.
II.	Cav. COSTANTINO PERAZZI, Royal Mining Engineer, Turin.
III.	Commendatore RAFFAELE PIRIA, Senator of the Kingdom, &c.
IV.	Prof. ADOLFO TARGIONI TOZZETTI.
	Cav. Prof. FILIPPO PARLATORE.
	Prof. EMILIO CORNAGLIA.
V., VI., VII., VIII.	Cav. PIETRO CONTI, M.P., Major Royal Engineers, &c.
IX.	LUIGI DELLA FONTE, Professor of Agriculture at Florence.
X.	Cav. CESARE VALERIO, M.P., Civil Engineer.
XI.	Cav. GIOVANNI CAVALLI, Lieut.-General of Artillery.
XIII., XIV., XV., XVI.	Cav. GILBERTO GOVI, Professor of Natural History at the University of Turin.
XVII.	Prof. ADOLFO TARGIONI TOZZETTI.
XVIII.	Cav. LORENZO COBIANCHI.
"	Dr. ROBERTO DE FILIPPI.
XIX.	Marquis LUIGI CUSANI.
XX.	Prof. FRANCESCO LUIGI BOTTER.
"	FILIPPO SESSA.
XXI.	GIUSEPPE OREFICE.
XXIV., XXV.	Cav. GIUSEPPE SELLA.
XXVIII.	Prof. GIACOMO ARNAUDON.
"	Cav. BARTOLOMEO CINI, &c.
XXIX.	CARLO AVONDO.
"	Cav. Prof. FRANCESCO BONAINI, Superintendent of the Public Archives in Tuscany.
"	Prof. CARLO MORELLI.
"	GIUSEPPE POGGI, Civil Engineer.
"	Father TOMMASO PENDOLA, Professor at the University of Sienna, and Director of the Deaf and Dumb Institution.
"	Prof. IGINO COCCHI.
XXX.	Prof. ADOLFO TARGIONI TOZZETTI.
XXXI.	Count DEMETRIO CARLO FINOCCHIETTI, &c.
"	Cav. GIULIO CURIONI, Secretary of the Lombard Institute, &c.
XXXII.	EDUARDO KRAMER, Civil Engineer.
XXXIII.	Cav. GIULIO CURIONI, &c.
XXXIV.	Commendatore TOMMASO CORSI, M.P., &c.
XXXV.	Cav. ASCANIO SOBRERO.
	Cav. GIULIO RICHARD.

## X.

## COMMISSION FOR GENERAL COMPILATION AND EDITING THE DESCRIPTIVE CATALOGUE.

Prof. Cav. FILIPPO PARLATORE.  
 Prof. ADOLFO TARGIONI TOZZETTI.  
 Prof. FILIPPO CALANDRINI.

# MEDALS AND HONOURABLE MENTIONS

AWARDED BY THE

## INTERNATIONAL JURIES.

### CLASS I.

#### MINING, QUARRYING, METALLURGY, AND MINERAL PRODUCTS.

#### MEDAL.

2077. ALBANI, Prince, Urbino—For the superior skill employed by him in the production of sulphur.
12. BOTTINO COMPANY—For an instructive collection of lead specimens illustrating the dressing and smelting of the ores.
39. FLORENCE NATURAL HISTORY MUSEUM (Geological Department)—For a complete and instructive collection of marbles, serpentine alabaster, and other materials of construction.
42. FRANEL, E. and Co., Turin—For an instructive collection of lead ores, lignites, and smelting products. (N.B.—There is an error in the catalogue; this refers to a smelting works at Pertusola, near Spezzia.)
52. GREGORINI, A., Lovere (Bergamo)—For iron and steel of good quality, puddled by gas derived from peat and lignite.
53. GUERRA, Count, Bros., Massa (Massa Carrara)—For good quality of marble, and the new processes employed in cutting and polishing it.
63. MAFFEI, Cav. N., Volterra (Pisa)—For remarkable character of his newly-discovered chalcedony, and for his collection of minerals.
68. MARCHESE, E. Cagliari—For a collection of the rocks and minerals of Sardinia, with a detailed catalogue.
79. MONTE ALTISSIMO MARBLE COMPANY, Florence—For production of the finest marbles in the Apuan Alps.
80. MONTEPONI MINING COMPANY, Cagliari—For specimens of lead ore representing a newly reopened and very extensive lead mine.
84. OLLOMONT MINING COMPANY, Aosta (Turin)—For copper of good quality.
2081. PATE AND SON, Leghorn—For fine specimens of antimony of good quality.
2086. RIGGARDI DI NETRO, Cav. E., Turin—For mineral products, and for an electro-magnetic machine, invented by Sella, for separating magnetic iron ores from copper ores.
94. ROMAGNA SULPHUR COMPANY, Bologna—For the economical process employed by them in the production of sulphur.
2107. ROYAL MILITARY ENGINEER CORPS, Naples—For topographical maps of the environs of Naples of the highest excellence.
112. ROYAL TUSCAN IRON MINES AND FOUNDRIES, Leghorn—For a fine collection of iron ores, and for iron of good quality.
104. SANTINI, G., Seravezza (Lucca)—For the zeal and skill employed in the development of several new quarries of marble near Seravezza.
100. SCACCHI, Professor, Naples—For fine collection of minerals and artificial crystals.
102. SERPIERI, E., Cagliari—For the successful introduction into Sardinia of a process for smelting lead from ancient slags.
2094. SLOANE, HALL, Bros., and COPPI, Florence—For a fine collection of copper ores, and for specimens of unwrought copper of excellent quality.
2097. TURIN ENGINEERING SCHOOL—For specimens of nickel ore and smelting products, representing a large and important undertaking.

## HONOURABLE MENTION.

8. BELTRAMI, Count P., Cagliari—For his enterprise in working the mines from which the specimens are sent.
11. BOLOGNA MINERAL COMPANY, Bologna—For interesting series of copper ores and maps of the mines.
13. BOUGLEUX, F., Leghorn—For opening out quarries of millstone in the Palæozoic rock north of Pisa.
16. BUCCI, G., Campobasso (Molise)—For fine collection of marbles from Campobasso.
1780. CAIMI, E., Sondrio—For interesting topographical delineation of the pass of the Stelvio.
20. CHIAVARI ECONOMIC SOCIETY, Genoa—For collection illustrative of the important slate quarries of Chiavari.
22. CHIOSTRI, L., Pomarance (Pisa)—For his geological map of the district of Libbiano, and specimens illustrating it.
122. COIOLI, E., Leghorn—For his new discovery of lignite, stated to be of superior quality, at Podernovo.
25. CORBI, ZOCCHI, Sienna—For excellence of material and importance of production of raw terra di Sienna.
30. DAMIOLI, S., Pisogne (Brescia)—For iron of good quality.
34. DÜDERLEIN, Prof., Modena—For his geological map of the environs of Modena.
37. FERRATA and VITALE, Brescia—For quality and large production of millstones, &c.
2100. CALI, Carlo—For collection of marbles and volcanic rocks of Sicily with associated minerals.
47. GENNAMARI AND INGURTUSU MINING COMPANY, Arbus (Cagliari)—For an interesting collection of lead ores.
48. GIOVANNINI, Brothers, Carmignano (Florence)—For the beauty of the material worked by them.
55. GUPPY and PATISSON, Naples—Iron of good quality.
56. HAUPT, T., Florence—For the utility of mineral facts registered in his plans of mines.
58. ITALIAN MARBLE COMPANY, Leghorn—For having opened out new and extensive marble quarries.
59. JACOBELLI, A. S., San Lupo (Benevento)—For fine collection of marbles.
64. MAGGI, SANTI, and BECCHINI, Montalcino (Sienna)—For excellence of their various products.
76. MILESI, A., Bergamo—Steel of good quality.
39. MINING COMPANY OF CASTELLACCIA, Florence—For a series of lead ores and their products, with maps of the mine.
78. MODENA AGRICULTURAL INSTITUTION—For rocks and earths applicable to agriculture.
95. ROMAN IRON MINING COMPANY, Rome—For a collection of iron rods, strips, and wire.
98. SADUN and ROSSELLI, Sienna—For specimens of ores of mercury, and for metallic quick-silver and vermilion.
2105. SIMI, Cav. A., Sevigliano (Lucca)—For production of a superior quality of marble.
2095. SPEZIA, Brothers—For the successful treatment of auriferous pyrites by amalgamation; (this refers to a mine called Peschiera, in the Valley of Ossola).
2078. ALBIANI-TOMEI, Cav. F., Pietrasanta—For marble slabs for flagging, produced at a low price.
115. VILLA, A. and G., Milan—For fossils of the upper Cretaceous (pietra forte) rocks of Brianza.

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## CLASS II.

### CHEMICAL SUBSTANCES AND PRODUCTS, AND PHARMACEUTICAL PRODUCTS.

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#### SECTION A.—*Chemical Products.*

##### M E D A L.

101. SARDINIAN SALT WORKS COMPANY, Cagliari—For the good quality and abundant production of sea salt.
158. DE LARDAREL, Heirs of Count, Leghorn—For having extended the manufacture of boracic acid founded by Count Lardarel.

35. DOL, Baldassare, Lessee of the Royal Salt Works of Comacchio, Ferrara—For good quality of sea salt obtained on a large scale.
186. DURVAL, Enrico, Monterotondo (Grosseto)—For boracic acid of good quality, and especially for having established near Monterotondo artificial boracic acid soffioni by means of artesian wells.
170. MIRALTA, Bros., Savona (Genoa)—For excellent quality of tartaric acid manufactured on a large scale.
155. PADRI SERVITI, Sienna—For alkaline carbonates of good quality, and for the merit of having applied substances previously valueless to useful purposes.
175. SCLOPIS, Bros., Turin—For the production of sulphuric acid from pyrites on a large scale.

## HONOURABLE MENTION.

189. LEONI, Antonio, Leghorn—For white lead of good quality manufactured by the Dutch process.
2110. LOFARO, B., Reggio (Calabria-Ulteriore)—For the large production of essences, and especially of that of bergamotte.
2111. MELISSARI, F. S., Reggio di C. (Calabria-Ulteriore)—For the good quality of his essences of bergamotte, lemon, oranges, and almonds, manufactured on a large scale.

SECTION B.—*Medical and Pharmaceutical Products and Processes.*

## MEDAL.

238. CONTESSINI, F., and Co., Leghorn—Sulphate of quinine, mannite, santonine, and other chemical products.
202. DUFOUR, Bros., Genoa—Organic chemical products of excellent manufacture.

## HONOURABLE MENTION.

818. MAZZUCHETTI, E., Turin—Manufacture of castor oil.
227. RUPINI, G., Bergamo—Finely crystallised mannite.
228. SOERNO, E., Genoa—Sulphate of quinine of good quality.

## CLASS III.

## SUBSTANCES USED FOR FOOD.

SECTION A.—*Agricultural Produce.*

## MEDAL.

264. ARESU, S., Cagliari—Wheat in the ear. Interesting.
265. BALLABINI, F., Imola (Bologna)—Specimens of rice to illustrate its cultivation: Chinese, Novara, and American rice.
269. BOLOGNA AGRICULTURAL SOCIETY—Collection. Interesting.
274. CASALI, A., Calci (Pisa)—Corn and flour. Excellence of quality.
361. CASEKTA SUB-COMMITTEE—For extensive and interesting collection.
288. DRAMMIS, Baron A., Scandale (Calabria-Ulteriore II.)—Collection. Excellence of quality.
377. FOGGIA SUB-COMMITTEE—Wheat. Excellence of quality.
381. GIUDICE, Giovanni, Favara (Girgenti)—Hard wheat, almonds, and linseed. Excellence of quality.
304. MAJORANA, Bros. Barons di N., Catania—Collection. Excellence of quality.
308. MAROZZI, E., Pavia—Rice, seed of pagliettone, and clover seed. Fineness of quality.
388. MILAN CHAMBER OF COMMERCE—The collection of the agricultural products of the provinces. For excellence of quality. Very instructive.
314. MODENA ROYAL BOTANICAL GARDENS—200 varieties of Indian corn collected by the late Prof. G. Brignoli.
315. MODENA SUB-COMMITTEE—Cereals and vegetable seeds. Excellence of quality.
379. PESARO AGRICULTURAL ACADEMY—The collection. Excellence of quality.

399. REGGIO AGRICULTURAL ASSOCIATION, Emilia—The collection of the principal agricultural products of the province, with prices attached. For excellence of quality and useful information.
347. TELLINI, V., Calci (Pisa)—Wheat flour. Excellence of quality.
348. TURIN AGRICULTURAL INSTITUTION—Collection. Excellence of quality.

## HONOURABLE MENTION.

261. ALEXANDRIA SUB-COMMITTEE—Various kinds of wheat collected in the province. Interesting collection.
354. BARONE, Bros., Foggia (Capitanata)—Hard and soft wheat. Goodness of quality.
323. BENEDICTINE MONKS, Catania—Wheat, barley, and beans. Goodness of quality.
358. CAMMARATA-SCOVAZZO, Baron Rocco, Palermo—Four varieties of wheat. Goodness of quality.
272. CANFORASSO SUB-COMMITTEE, Molise—Wheat. Goodness of quality.
276. CASERTA PROVINCIAL AGRICULTURAL GARDEN (Terra di Lavoro)—Collection. Goodness of quality.
362. CASSANO, Francesco, Gioja (Terra di Bari)—Wheat only. Goodness of quality.
281. CHERICI, N., San Sepolcro (Arezzo)—Collection. Interesting.
363. CHIARINI, Paolo, Faenza (Ravenna)—Cleaned American, Chinese, and Italian wheat.
370. DE LUCA, Pasquale, Catania—Pistachio nuts. Goodness of quality.
290. FERRARA ROYAL CHAMBER OF COMMERCE—For variety of collection.
293. GIORDANO, E., Salerno (Principato-Citeriore)—For variety of collection.
297. GUIDA, G. and G., Gargarengo (Novaro)—Wheat and rice. Goodness of quality.
303. MACERATA SUB-COMMITTEE—Wheat and corn. Goodness of quality.
387. MERCATILI, Count Michele, Ascoli—Rice. Goodness of quality.
330. PASTI, G., Ferrara—Beans. Goodness of quality.
2123. SANTORO, Gabriele, San Agatha (Capitanata)—Wheats. Goodness of quality.
2126. SCOCCHERA, Savino, Canosa (Terra di Bari)—Castor oil seeds. Goodness of quality.
346. TARDITI and TRAVERSA, Brà (Turin)—Semolino. Goodness of quality.

SECTION B.—*Drysaltery, Grocery, and Preparations of Food as sold for Consumption.*

## MEDAL.

773. TOMEI, ALBIANI, Cav. F., Pietra Santa (Lucca)—Olive oil. Excellence of quality.
713. BANCALARI, L., Chiavari (Genoa)—Olive oil. Excellence of quality.
401. BENEDETTI, P., Brothers, Faenza (Ravenna)—Alimentary paste. For excellence of quality.
456. BIFFI, Paolo, Milan—Chocolate and confectionery. For excellence of quality.
718. BOTTI, A., Chiavari (Genoa)—Olive oil. Excellence of quality.
783. CAGLIARI SUB-COMMITTEE—Olive oil. Excellence of quality.
405. CALDERAI, A., Florence—Sausages. Excellence of quality.
788. CASERTA SUB-COMMITTEE—Olive oil. Excellence of quality.
721. CATTANEO, G. B., Chiavari (Genoa)—Olive oil. Excellence of quality.
793. D'AMBROSIO, Luigi, Deliceto (Capitanata)—Olive oil. Excellence of quality.
496. DAMIANI, C., Porto-Ferrajo (Leghorn)—Biscuits. For excellence of quality.
724. DANIELLI and FILIPPI, Buti (Pisa)—Olive oil. Excellence of quality.
725. DANZETTA, Baron, and Brothers, Perugia (Umbria)—Olive oil. Excellence of quality.
727. DE GORI, Count A., Siena—Olive oil. Excellence of quality.
796. D'ERCHIA, Angelo, Monopoli (Terra di Bari)—Olive oil. Excellence of quality.
800. DI RIGNANO, Marquis, Foggia (Capitanata)—Olive oil. Excellence of quality.
411. FORNI, A., Bologna—Bologna sausages. For excellence of quality.
412. FRANZINI, Baldassare, Pavia—Cheese. Excellence of quality.
736. Giordano, G., Naples—Olive oil. Excellence of quality.
737. GIUSTI, N., Pisa—Olive oil. Excellence of quality.
738. GRISALDI DEL TAIA, Sienna—Olive oil. Excellence of quality.
416. GUELFI, G., Navacchio (Pisa)—Biscuits. For excellence of quality.
807. LOMONACO, Bros., Corato (Terra di Bari)—Olive oil. Excellence of quality.
383. LECCE SUB-COMMITTEE, Terra d'Otranto—Dried figs, and preparations of figs and almonds. Excellence of quality.
810. MACERATA SUB-COMMITTEE—Olive oil. Excellence of quality.
423. MAJORANA, Bros., Barons di N., Catania—Honey. For excellence of quality.
425. MARINI DEMURO, Avv., T., Cagliari—Honey. For excellence of quality.

477. MATTEI, Antonio, Prato (Florence)—Biscuits. For excellence of quality.  
 483. MELISSARI, F. S.—Olives. Excellence of quality.  
 747. MILAZZO, Junta, Messina—Olive oil. Excellence of quality.  
 750. MINUTOLI TETRINI, Count E., Lucchesi—Olive oil. Excellence of quality.  
 500. ORTALLI, L., Parma—Cheese. Excellence of quality.  
 756. OTTOLINI BALBIANI, Countess C., Lucchesi—Olive oil. Excellence of quality.  
 2209. PALIZZI, Baron Carlo, Reggio (Calabria)—Olive oil. Excellence of quality.  
 431. PAOLETTI, F., Pontedera (Pisa)—Alimentary paste. Excellence of quality.  
 759. PIERI PECCI, G., Siena—Olive oil. Excellence of quality.  
 2217. PORTO MAURIZIO, SUB-COMMITTEE—Olive oil. Excellence of quality.  
 2219. RICASOLI, Baron Bettino, Florence—Olive oil. Excellence of quality.  
 764. SARDINI, G., Lucchesi—Olive oil. Excellence of quality.  
 784. SCOCCHERA SAVINO, Terra di Bari—Olive oil. Excellence of quality.

## HONOURABLE MENTION.

447. AMICARELLI V., Monte S. Angelo (Capitanata)—Honey. Goodness of quality.  
 449. BARBETTI, Santi, Foligno (Umbria)—Confectionery. Goodness of quality.  
 450. BARACCO, Baron A., Naples—Olives. Goodness of quality.  
 717. BELLELLA, Cav. E., Capaccio (Principata Citeriore)—Olive oil. Goodness of quality.  
 454. BERNARDI, Bros., Borgo a Buggiano (Lucca)—Biscuits. Goodness of quality.  
 402. BIANCHI, G. C., Lucca—Alimentary paste. Goodness of quality.  
 782. BOCCARDI, Bros., Candela (Capitanata)—Olive oil. Goodness of quality.  
 403. BOSCARIELLI, A., Cosenza (Calabria Citeriore)—Preserved larks. Goodness of quality.  
 461. BRASINI, Bros., Forlì—Chocolate. Goodness of quality.  
 406. CESARI, L., Torre Annunziata (Naples)—Alimentary paste. Goodness of quality.  
 469. CIOPPI, L. and S., Pontedera (Pisa)—Alimentary paste. Goodness of quality.  
 471. DE GAETANO, F., Gallico (Calabria Ulteriore)—Alimentary paste. Goodness of quality.  
 473. DEMURTAS, E., Lanusei (Cagliari)—Alimentary paste. Goodness of quality.  
 729. DE RUBERTIS, L., Lucito (Molise)—Olive oil. Goodness of quality.  
 407. DOZZIO G., Belgiojoso (Pavia)—Cheese. Goodness of quality.  
 474. FARINA, Bros., Baronissi (Principata Citeriore)—Cheese. Goodness of quality.  
 412. FRANZINI, Baldassare, Pavia—Cheese. Goodness of quality.  
 434. PARMA SUB-COMMITTEE—Cheese. Goodness of quality.  
 734. GAVIANO, A., Lanusei (Cagliari)—Olive oil. Goodness of quality.  
 502. GIARDINI, Bologna—Cheese. Goodness of quality.  
 415. GIULIANI, V., Turin—Chocolate. Goodness of quality.  
 497. LANNICELLI, M., Salerno (Principato Citeriore)—Alimentary paste. Goodness of quality.  
 418. LAMBERTINI, G., Bologna—Bologna sausages. Goodness of quality.  
 498. MARINELLI, E., Parma—Alimentary paste. Goodness of quality.  
 812. MASSETI, Count Pietro, Florence—Olive oil. Goodness of quality.  
 813. MASSELLI, Antonio, S. Severo (Capitanata)—Olive oil. Goodness of quality.  
 426. MILAZZO, Junta, Messina—Olives. Goodness of quality.  
 2207. MUNICIPALITY OF ORTONA, Abruzzi—Olive oil, figs, and raisins. Goodness of quality.  
 430. ORSI, R. and Co., Bologna—Bologna pork sausages. Goodness of quality.  
 433. PAOLETTI, O. and A., Bros., Florence—Biscuits. Goodness of quality.  
 395. PASCAZIO, Vito, Mola (Terra di Bari)—Dried figs, and preparation of figs and almonds. Goodness of quality.  
 763. RICCARDI, Strozzi C., Florence—Olive oil. Goodness of quality.  
 2221. ROSPIGLIOSI, Prince, Pistoja (Florence)—Olive oil. Goodness of quality.  
 2223. SANTORO, Gabrielli, S. Agata (Capitanata)—Olive oil. Goodness of quality.  
 503. SERRA, L., Iglesias (Cagliari)—Cheese. Goodness of quality.  
 493. TRUCILLI, V., Salerno (Principato Citeriore)—Cheese. Goodness of quality.

SECTION C.—*Wines, Spirits, Beer, and other Drinks, and Tobacco.*

## M E D A L.

505. AGNINI, Tommaso, Modena—Rosolio liqueur. General excellence.  
 512. ALLEMANO, Bros., Asti (Alexandria)—For wines of excellent quality and condition.  
 517. BARACCO, Nicola, and Co., Turin—Rum and vermouth liqueur. General excellence.  
 667. BAZZIGER and Co., Lassirolì (Modena)—Peppermint. General excellence.  
 528. BENEVENTO SUB-COMMITTEE, Benevento—For home-grown leaf tobacco.  
 529. BRAGGIO, Count, F., Strevi (Alexandria)—For wines of excellent quality and condition.

673. BUELLI, E., Bobbio (Pavia)—For wines of excellent quality and condition.
533. CAGLIARI SUB-COMMITTEE—For a collection of Sardinian wines of excellent quality and condition.
2136. CATANIA SUB-COMMITTEE—For collection of wines of Sicily of excellent quality and condition.
543. CLARKSON, S. V., Mazzara (Trapani)—For wines of Sicily of excellent quality and condition.
685. COSTARELLI, Martino, Catania—For wines of Sicily of excellent quality and condition.
554. DEL PRINO, Dr. M., Vesime (Alessandria)—For wines of Sicily of excellent quality and condition.
691. DEL TOSCANO, The Marquis, Catania—For wines of Sicily of excellent quality and condition.
699. FIAMMINGO, G. B., Riposto (Catania)—Alcohol from wine. General excellence.
700. FLORIO, Brothers, Asti (Alessandria)—For wines of excellent quality and condition.
565. GARAU, CARTA L., Santuri (Cagliari)—For wines of Sardinia of excellent quality and condition.
567. GENTA, P., Caluso, (Turin)—For wines of excellent quality and condition.
709. GIOENI, Vincenzo of Trigona, Catania—For wines of Sicily of excellent quality and condition.
2148. MAJORANA, Bros., Barons di N., Catania—For wines of Sicily of excellent quality and condition.
2151. MARCHI, L., Florence—Rosolio liqueur. General excellence.
2155. MASSETTI, Count P., Florence—Wines. General excellence.
601. MURGIA, G., Santuri (Cagliari)—For wines of Sardinia of excellent quality and condition.
606. OUDART, L., Genoa—For Piedmontese wines of excellent quality and condition.
607. OVADA, THE MUNICIPALITY OF, Alessandria—For wines grown in its district of excellent quality and condition.
2169. PAGLIANO, F., Asti (Alessandria)—For Asti wines of excellent quality and condition.
609. PALUMBO, O., Trani (Terra di Bari)—For wines of the province, of excellent quality and condition.
614. PATRICO, DR. V., Trapani—For wines of Sicily of excellent quality and condition.
627. RAVIZZA, Bros., Orvieto (Umbria)—For wines of the central provinces of excellent quality and condition.
2179. REGGIO SUB-COMMITTEE, Calabria-Ulteriore—For wines of the province, of excellent quality and condition.
629. RICASOLI, Baron Battino, Florence—For wines of the central provinces, of excellent quality and condition.
631. RICCI, G. B., Asti, Alessandria—For Piedmontese wines of excellent quality and condition.
522. ROYAL TOBACCO MANUFACTORY OF BOLOGNA—For the excellence of their manufactured tobacco.
2163. ROYAL TOBACCO MANUFACTORY OF NAPLES AND CAVA—For the excellence of their manufactured tobacco.
2192. ROYAL TOBACCO MANUFACTORY OF SESTRI POENTE, Genoa—For the excellence of their manufactured tobacco.
654. ROYAL TOBACCO MANUFACTORY OF TURIN—For the excellence of their manufactured tobacco.
637. SALIS FRANCESCO, Lanusei (Cagliari)—For Sardinian wines of excellent quality and condition.
643. SCAZZOLA, G. D., Cascine (Alessandria)—For Piedmontese wines of excellent quality and condition.
2196. SYLOS LABINI, V., Bitonto (Terra di Bari)—For wines of the province, of excellent quality and condition.
656. VALLINO, Bros., Bra (Cuneo)—For wines of the province, of excellent quality and condition.
657. VARVELLO, F., Asti (Alessandria)—For wines of the province, of excellent quality and condition.

## HONOURABLE MENTION.

511. ALESSI, G., Messina—For tobacco in leaf and manufactured.
516. BALLOR, G., and Co., (Turin)—Vermuth wine. Goodness of quality.
2135. BATRERA—Rosolio liqueurs. Goodness of quality.
670. BIFFI, P., Milan—Latte di Vecchia. Goodness of quality.
527. BOTTI, A., Chiavari (Genoa)—For wines of the province, of good quality and condition.

674. CAMPOLONGHI, G. B., Parma—Rosolio liqueur. Goodness of quality.  
 561. FAVARA VERDIBAME, V., Mazzara (Trapani)—For wines of Sicily, of good quality and condition.  
 2135. FAVA, N.—For wines of Southern provinces, of good quality and condition.  
 562. FERRARINI, Dr. A., Reggio d'Emilia—For wines of central provinces, of good quality and condition.  
 563. GRISALDI DEL TAIA, Dr. C., Siena—For wines of central provinces, of good quality and condition.  
 2204. IVALDI, D., Acqui (Alexandria)—For wines of southern provinces, of good quality and condition.  
 572. LAI, L., Lanusei (Cagliari)—For wines of Sardinia, of good quality and condition.  
 580. MARINI DEMURO, Cagliari—For wines of Sardinia, of good quality and condition.  
 582. MARIETTI, G., Savona (Genoa)—Savona Latte di Vecchia liqueur. Goodness of quality.  
 591. MILAZZO, JUNTA OF, Messina—For collection of wines of Sicily, of good quality and condition.  
 2160. MONCADA, A., Catania—For wines of Sicily, of good quality and condition.  
 597. MONTINI, P., Fabriano (Ancona)—Bordeaux anise. Goodness of quality.  
 616. PENNACCHI, F., Orvieto (Umbria)—For wines of central provinces, of good quality and condition.  
 2174. PETROFEMILIO, A., Ortona (Abruzzo-Citeriore)—Liqueur Rosolio. Goodness of quality.  
 2176. PRATTI, GIUSEPPE, Alexandria—Elixir du Grand St. Bernard. Goodness of quality.  
 2138. PRANDI, L.—For wines of southern provinces, of good quality and condition.  
 ROYAL FACTORIES OF—  
 540. BRESCIA—Manufactured tobacco of good quality.  
 563. FLORENCE—Manufactured tobacco of good quality.  
 575. LUCCA—Manufactured tobacco of good quality.  
 2153. MASSA-CARRARA—Manufactured tobacco of good quality.  
 589. MILAN—Manufactured tobacco of good quality.  
 592. MODENA—Manufactured tobacco of good quality.  
 2172. PARMA—Manufactured tobacco of good quality.  
 2180. SALIMBENI, L., Modena—Anise liqueur. Goodness of quality.  
 641. SATTÀ FLORIS, R., Cagliari—For wines of Sardinia, of good quality and condition.  
 2134. SCALITI, N., Acqui (Alexandria)—For wines of good quality.  
 2194. SISTO, the Baron, A., Catania—For wines of Sicily, of good quality and condition.  
 661. VITTONI, F., Milan—Elixir de Gems, ten samples. Goodness of quality.

## CLASS IV.

### ANIMAL AND VEGETABLE SUBSTANCES USED IN MANUFACTURES.

#### SECTION A.—*Oils, Fats, and Wax, and their Products.*

##### MEDAL.

720. CAROBBI, G., Florence—Excellent manufacture of wax and wax candles.  
 723. CONTI, E. and Sons, Leghorn—Excellent quality of olive-oil, marbled and seed-oil soaps.  
 724. DANIELLI and FILIPPI, Manufacturers and Collectors, Buti (Pisa)—Oils, showing steps of purification.  
 805. GIRARDI, Martino, Turin—Excellent collection of oils.  
 808. LANZA, Bros., Turin—Excellent manufacture of stearic acid and stearic candles.  
 749. MILAN CHAMBER OF COMMERCE—Fine collection of twelve kinds of oils.  
 753. NOBERASCO and ACQUARONI, Savona (Genoa)—Several marbled and plain soaps of excellent quality.  
 2228. SERVENTI, Heirs of, Parma—Excellent manufacture of wax and wax candles.  
 767. SQUARO, E., Leghorn—Excellent manufacture of stearic acid and stearic candles.

##### HONOURABLE MENTION.

2213. PAOLUCCI, Marquis G. B., Forlì—Good collection of oils.  
 768. TACCHI, G., Bergamo—Goodness of manufacture of wax and wax candles.

SECTION C.—*Vegetable Substances used in Manufactures, &c.*

## MEDAL.

958. ADMINISTRATION OF THE FOREST OF SONDRIO—For the fine collection of timber wood, with a table giving particulars of growth, value, and other information.
880. ANZI, Don Martino, Bormio (Sondrio)—For a very large and most carefully prepared collection of Italian lichens.
969. ARNAUDON, Professor Giacomo, Turin—For a collection of timber woods, and for dyeing and tanning materials.
889. BELLELLA, Cav. Enrico, Capaccio (Pincipata Citeriore)—For finely grown and prepared madder roots.
890. BELTRAMI, Cav. Pietro, Cagliari—For specimens of very fine cork wood grown by himself.
892. BENZI, Tito, Carpi (Modena)—For very fine willow plait.
976. BIANCAVILLA, Municipality of—For short-staple cotton. Value 1s. 1½d. per lb.
894. BIAVATI, Pietro, Crevalcore (Bologna)—For hemp of fine quality.
978. BISCARI, Prince of, Catania—For short-staple cotton. Value 1s. 1d. per lb.
896. BONORA, Albino, Ferrara—For hemp of fine quality.
897. BOTTER, Professor, Bologna—For a most admirable collection, containing materials for a complete monograph of the hemp plant and its culture.
899. CAGLIARI SUB-COMMITTEE—For a collection of Italian products, consisting of flax, hemp, dyeing materials, gums, cork, &c.
900. CALABRINI, Professor Filippo, Florence—For a collection of 185 species of woods admirably prepared and carefully named.
903. CERTANI, Annibale, Bologna—For hemp of fine quality.
904. CHERICI, Niccolò, S. Sepolcro (Arezzo)—For a collection of timber woods, also preparations of woad and amadou.
906. CRIPPA, Ida, Florence—For a collection of the seeds of *Pinus Pinea*, and pine seed oil.
909. FACCINI, Brothers, Bologna—For hemp of fine quality.
911. FERRARA ROYAL CHAMBER OF COMMERCE—For hemp of fine quality.
910. FAVARA VERDIRAME, V., Trapani—For white Siamese cotton, short-staple. Value 13d. per lb.
915. FRÖLICH and Co., Castellamare (Naples)—For excellent specimens of ground madder and garancine.
1875. FRULLINI, Luigi, Florence—For carvings in wood of great artistic merit.
988. GIUDICE, Gasparo, Girgenti—For fine samples of powdered sumac.
1823. GIUSTI, Professor P., Sienna—For carvings in wood and ivory of great excellence.
1856. GRANDVILLE, Michele, Sorrento (Naples)—For marqueterie and wood inlaying in very beautiful design and workmanship.
2260. ITALIAN CRYPTOGAMICAL SOCIETY—For an excellent herbarium of the cryptogamic plants of Italy.
1827. LANCETTI, F., Perugia (Umbria)—For inlaid work of wood.
926. MAFFEI, Cav. Niccolò, Volterra (Pisa)—For a collection of timber woods and tanning materials.
928. MAJORANA, Brothers, Barons di N., Catania—For a large collection of dye-stuffs of Italian growth; samples of cotton, value 13½d. per lb.; and for various other vegetable products.
931. MODENA SUB-COMMITTEE—For preparations of willow for plait.
934. NAPLES SUB-COMMITTEE—For short-staple cotton. Value 13d. per lb.
2032. NARDI, R. and Son, Montelupo (Florence)—For a collection of flasks protected by straw work.
944. PASOLINI, Giuseppe, Imola (Bologna)—For hemp of fine quality.
1839. PASQUINI, G., Florence—For engine-cut veneers.
2262. PESARO AGRICULTURAL ACADEMY—For a very carefully prepared series of specimens of timber woods, arranged to show three different sections of each.
1348. QUADRI, Enrico, Naples—For hemp of fine quality.
948. RAVENNA SUB-COMMITTEE—For a collection of the products of the forests of Ravenna.
2241. REGGIO AGRICULTURAL ASSOCIATION, Reggio (Emilia)—For a very practical collection of timber woods, with their various applications designated.
952. RENUCCI, Virgilio, Florence—For very finely grown wheat straw for plaiting.
2243. ROYAL ITALIAN COMMITTEE—For a general collection of cotton grown in Italy.
961. TEDESCHI, L. I., Reggio (Emilia)—For the roots of *Chrysopogon Gryllus*, prepared, and for brushes made of the same.
2253. UGO, Marquis Giuseppe, Catania—For fine short-staple cotton. Value 1s. 2d. per lb.
967. VONWILLER, D., and Co., Naples—For short-staple cotton from Naples. Value 13½d. per lb.

## HONOURABLE MENTION.

1886. AMBROGIO, Giuseppe, S. Alessandro (Brescia)—For carving in cork.  
 968. AMICARELLI, Vincenzo, Monte Sant' Angelo (Capitanata)—For specimens of resin collected from *Pinus Pinaster*.  
 970. ASCOLI SUB-COMMITTEE—For specimens of weld (*Reseda luteola*).  
 881. AUGIAS, Salvatore, Tempio (Sassari)—For a collection of native lichens used in dyeing.  
 971. AVELLINO SUB-COMMITTEE—For a collection of woods.  
 882. AVENTI, Count Francesco Maria, Ferrara—Hemp of fine quality.  
 972. BACCINI, Giovanni, Florence—For brushes and carpet-brooms, made of the stalks of sorghum.  
 888. Bellella, Giovanni, Salerno (Principato Citeriore)—For specimens of madder.  
 893. BERNARDUSI, Aurelio, Ferrara—Hemp of fine quality.  
 895. BOLOGNA AGRICULTURAL SOCIETY—For preparations of the *Botis silicealis*, the insect which injures the hemp plant, with specimens of its ravages.  
 977. BRINDISI SUB-COMMITTEE, Terra d'Otranto—For short staple cotton. Value, 12d. per lb.  
 899. CAGLIARI SUB-COMMITTEE—Short staple white Siamese cotton. Value, 12d. per lb.  
 901. CAMPOBASSO SUB-COMMITTEE, Molise. For madder roots.  
 902. CAVALIERI, P., Ferrara—Hemp of fine quality.  
 1874. FRANCESCHI, E., Florence—For carvings in wood.  
 1822. GARGIULO, Luigi, Sorrento (Naples)—For inlaid wood-work.  
 917. GIRGENTI SUB-COMMITTEE—For short staple cotton. Value, 12d. per lb.  
 924. MACCAFFERRI and Co., Bologna—Hemp of fine quality.  
 929. MARATTI, Vincenzo, Benevento—For a collection of timber woods.  
 2035. MENCACCI, M. and Co., Lucca—For straw-work covering for flasks.  
 931. MODENA SUB-COMMITTEE—For illustrations of the application of the roots of *Chrysopogon Gryllus* to the manufacture of brushes, and for very finely prepared willow for plaiting.  
 934. NAPLES SUB-COMMITTEE—For short-staple white Siamese cotton, cultivated at Torre Annunziata. Value, 12½d. per lb.  
 2266. PATERNO, Municipality of, Catania—For cotton.  
 946. PAVANELLI, Giuseppe, Ferrara—Hemp of fine quality.  
 946. PICCALUGA, Giuseppe, Cagliari—For a collection of woods, containing fine specimens of *Medicago arborea* of large size.  
 2263. PICCHI, Pietro, Leghorn—For corkwood and corks.  
 1842. SCALETTI, Antonio, Florence—For carvings in ebony.  
 2264. SEMMOLA, Cav. Francesco, Naples—For a collection of timber woods.  
 2250. SINISCALCO, F., Salerno (Principato Citeriore)—For teasels and amadou, prepared and unprepared.

## SECTION D.—Perfumery.

## MEDAL.

2274. GARDNER and ROSE, Palermo—Essential oil. Excellence of quality.  
 2111. MELISSARI, F. S., Reggio (Calabria Ulteriore)—Essential oil. Excellence of quality.  
 770. TURCHI, L. and Co., Ferrara—Toilet soap. Excellence of quality.

## HONOURABLE MENTION.

194. BORTOLOTTI, P., Bologna—Felsina water. Goodness of quality.  
 188. GULLI, G., Reggio (Calabria Ulteriore)—Essential oils. Goodness of quality.  
 2110. LOFARO, B., Reggio (Calabria Ulteriore)—Essential oils. Goodness of quality.  
 246. MESSINA SUB-COMMITTEE—Essential oils. Goodness of quality.

## CLASS V.

## RAILWAY PLANT, INCLUDING LOCOMOTIVE ENGINES AND CARRIAGES.

## MEDAL.

1007. AGUDIO, T., Turin—Model showing good mechanical arrangements for working very steep inclines.

## HONOURABLE MENTION.

1002. PIETRARSA ROYAL WORKS—Locomotive engine.  
 1006. VINCENZI, Lieut. E., Modena—Electric signal.

## CLASS VII.

## MANUFACTURING MACHINES AND TOOLS.

SECTION A.—*Machinery employed in Spinning and Weaving, &c.*

## MEDAL.

1020. BONELLI, Cav. G., Turin—For his electric Jacquard loom, and especially for the arrangement of the pistons.  
 1029. VINCENZI, Lieut. E., Modena—For his Jacquard machine with reduced size cards, and for the ingenious mechanism which enables the thinnest and smallest cards to be used.

## HONOURABLE MENTION.

1026. GUPPY and PATISSON, Naples—For the good construction of their machine for winding and reeling silk from the cocoon.

SECTION B.—*Machines and Tools employed in the Manufacture of Wood and Metal.*

## MEDAL.

1044. SOMMEILLER, GRANDIS, and GRATTONI, Turin—For plans of a machine for perforating rock.

## CLASS VIII.

## MACHINERY IN GENERAL.

## HONOURABLE MENTION.

1001. GRIMALDI, F., Naples—Rotary steam boiler.  
 1058. PIETRARSA ROYAL IRON WORKS, Naples—Shaft, &c.

## CLASS IX.

## AGRICULTURAL AND HORTICULTURAL MACHINES AND IMPLEMENTS.

## MEDAL.

1084. BERTONE DI SAMBUY, Marquis, Turin—For his ploughs.  
 1087. BOTTER, Prof. F., Bologna—For his collection of implements used in the culture of hemp, and for his plough.  
 1091. CIAPETTI, B., Castel-Florentino (Florence)—For his Tuscan plough and thrashing machine for maize.  
 1093. DE CAMBRAY DIGNY, Count, Florence—For his light and well-made ploughs.  
 1102. GUPPY and PATISSON, Naples—For their oil machinery and apparatus for reeling cocoons.  
 1113. PIZZARDI, Marquis, and Bros., Bologna—For their improvement of machinery for chopping up horns and hoofs.

## HONOURABLE MENTION.

1078. BATTAGLIA, G., Cernignana (Como)—For his apparatus for unwinding cocoons.  
 1085. BOLOGNA AGRICULTURAL SOCIETY—For a model of a Bologna hemp farm.  
 1090. CERTANI, A., Bologna—For his subsoil and trenching plough.  
 1095. DELLA BEFFA, G., Genoa—For his thrashing machines.  
 1098. FACCHINI, Bros., Bologna—For a model of implement for softening hemp.  
 1101. GIUNTINI, O., Peccioli (Pisa)—For the good workmanship of his plough.  
 1104. KRAMER, E.—For his models illustrating winter irrigations.  
 1106. MACCAFERRI, D.—For his apparatus for softening hemp.  
 1111. PAGNONI, A.—For his model of machine for breaking hemp.  
 1112. PASQUI, G., Forlì—Implements employed in hop cultivation.  
 1109. ROYAL LOMBARD LITERARY INSTITUTION—For their model of exit gates for irrigation  
 1119. STAFFUTI, O., Pesaro—For his corking machine.

## CLASS X.

## CIVIL ENGINEERING, ARCHITECTURAL AND BUILDING CONTRIVANCES.

SECTION A.—*Civil Engineering and Building Contrivances.*

## MEDAL.

2282. CAMPANA, Marquis G., Naples—For excellence of manufacture of artificial marbles.  
 1143. COLONNESE, F. and G., Naples—Enamelled bricks and tiles. For lowness of price and excellence of manufacture.  
 2289. RABBINI, Cav. A., Turin—For the excellence and extent of the Cadastral surveys in Sardinia.  
 1151. RONDANI, T., Parma—Tiles, hollow bricks, &c. For excellence of quality.

## HONOURABLE MENTION.

1154. TREVES, M., Florence—Artificial marbles. For excellence of manufacture.

SECTION C.—*Objects shown for Architectural Beauty.*

## MEDAL.

1142. CARAFA DI NOIA, P., San Giovanni, a Teduccio (Naples)—Tubes, tiles, cornices, &c., in terra cotta. Beauty of application and good material.  
 2287. MATTARELLI, Giacomo, Lecco (Como)—Beautiful execution of model of Milan Cathedral.

## HONOURABLE MENTION.

1148. PELAIS, G., Pistoia (Florence)—Researches in the manufacture of cement.

## CLASS XI.

## MILITARY ENGINEERING, ARMOUR AND ACCOUTREMENTS, ORDNANCE AND SMALL ARMS.

SECTION C.—*Arms and Ordnance.*

## MEDAL.

2364. CASTELLANI, Rome—For the sword presented by the inhabitants of Rome to His Majesty the King of Italy, designed by the Duke Michael Angelo Gaetani, and executed by Castellani of Rome.  
 2375. CORTELLAZZO, A., Vicenza—For the artistic beauty of the mounting of his swords.  
 1201. MEROLLA, S., Naples—For excellence in workmanship in guns, and for his cap protector.

1204. PARIS, MICHELONI, and PREMOLI, Brescia—For the goodness of the gun-barrels manufactured by the Brescia Gun Company.  
 2364. RINZI, Milan—For the artistic beauty of the mounting of his swords.  
 1218. ROYAL FOUNDRY OF TURIN—For the Cavalli gun exhibited by the department.

#### HONOURABLE MENTION.

2009. BORANI, Cav. M., Turin—For good workmanship and artistic beauty in the mounting of his swords.  
 1191. COLOMEO, C. M., Milan—For his collection of small arms.  
 1192. COMINAZZI, M., Gardone (Brescia)—For the goodness and cheapness of his gun-barrels.  
 1196. IZZO, A., Naples—For good workmanship in fowling-pieces.  
 1217. MONGIANA ROYAL FACTORY, Mongiana (Calabria Ulteriore)—For the good workmanship in sword blades.

### CLASS XIII.

#### PHILOSOPHICAL INSTRUMENTS AND PROCESSES DEPENDING ON THEIR USE.

#### MEDAL.

1227. BONELLI, G., Turin—For originality of construction in his copying electric telegraph.  
 1232. JEST, Carlo, Turin—For economical construction and good workmanship in his philosophical instruments.  
 2290. LENDI—For the minuteness and delicacy of the workmanship of his microscopic medals.

#### HONOURABLE MENTION.

1236. BANDIERI, G., Naples—For novelty and ingenuity of construction in chemical balances.  
 1231. GONNELLA, T., Florence—For the ingenuity and simplicity of the construction of his calculating machine.

### CLASS XIV.

#### PHOTOGRAPHY AND PHOTOGRAPHIC APPARATUS.

#### MEDAL.

1257. ALINARI, Bros., Florence—For great excellence of photographic productions.  
 1250. VAN LINT, E., Pisa—For excellence of pictures exhibited.

#### HONOURABLE MENTION.

1249. RONCALLI, A., Bergamo—For excellence of microscopic reproductions.

### CLASS XV.

#### HOROLOGICAL INSTRUMENTS.

#### HONOURABLE MENTION.

1256. DEGANINI, C., Florence—Escapement for clocks.

## CLASS XVI.

### MUSICAL INSTRUMENTS.

#### M E D A L.

1265. AIELLO, S., Naples—Excellence of musical strings.  
 1278. PELITTI, C., Milan—For good quality of bass brass instruments.

#### H O N O U R A B L E M E N T I O N.

1267. DE MEGLIO, L., Naples—For piano.  
 1270. MARZOLO, G., Padua—Ingenuity of invention for printing music.  
 1276. PELITTI, G., Milan—For the excellence of his brass instruments.

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## CLASS XVII.

### SURGICAL INSTRUMENTS.

#### M E D A L.

1293. LOLLINI, P. and P., Bologna—For great ingenuity in the contrivance and excellence in the manufacture of numerous surgical, obstetric, and ophthalmic instruments.

#### H O N O U R A B L E M E N T I O N.

1291. GADDI, Prof. M., Modena—For a series of beautiful preparations of the internal ear.

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## CLASS XVIII.

### COTTON.

#### M E D A L.

1227. HOZ and FONZOLI, Terni (Umbria)—For manufactured productions of merit.  
 1313. LUALDI, E., Brescia—For very good cotton yarn.  
 1314. MILAN CHAMBER OF COMMERCE—For many useful manufactures.

#### H O N O U R A B L E M E N T I O N.

1323. THOMAS, A., Milan—For cotton goods.  
 1324. VONWILLER and Co., Naples—For yarns.  
 1325. ZEPPINI, F., Pontedera (Pisa)—For counterpanes.

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## CLASS XIX.

### FLAX AND HEMP.

#### M E D A L.

1333. COSTA, Giulia, Chiavari (Genoa)—Huckaback towels with fringes. For assortment, general excellence.  
 1352. FRÉBIGNI, G., Leghorn—Hemp ropes. For skilful manufacture  
 1345. PELLEGRINETTI, F., Florence—Linen table cloths. For skilful manufacture.  
 954. RIZZOLI, R., Bologna—Hemp yarns. For great excellence.

#### H O N O U R A B L E M E N T I O N.

1334. DE ANGELIS, Bros., Naples—For good make of sail cloth.  
 1335. DEVOTO, L., Chiavari (Genoa)—For variety of linens and peculiarity of well made towels.

1336. FERRARA ROYAL CHAMBER OF COMMERCE—For variety and good make of hand made ships' cable, marlines, ropes, and sail cloth.  
 1339. MILAN CHAMBER OF COMMERCE—For a collection illustrating the linen manufacture of the province.  
 1341. NOBERASCO, L., Savona, Genoa—For good manufacture of sail cloth.

## CLASS XX. SILK AND VELVETS

### MEDAL.

1365. ABBATE, P., Parma—Raw silk. For superior quality and merit.  
 1375. BAVASSANO, G. B., Alexandria—Raw silk. For superior quality and merit.  
 1377. BELLINI, G., Osimo (Ancona)—Raw silk. For superior quality and merit.  
 1378. BELLINO, Bros., Turin—Raw silk. For superior quality and merit.  
 1387. BERIZZI, S., Bergamo—Raw and thrown silk, also of China. For superior quality and merit.  
 1385. BOLMIDA, Bros., Turin—Raw, thrown, and waste carded silk. For superior quality and merit.  
 1387. BOZZOTTI, C., and Co., Milan—For raw and thrown silk, also of China, and especially for sewing silk of superior quality and merit.  
 1388. BRAVO, M., and Sons., Turin—For raw and thrown silk of superior quality and merit.  
 1389. BRUNI, F., Milan—Dyed silk, mineral black. Superior quality and merit.  
 1390. CARRADORI, Count G., Osimo (Ancona)—Raw silk. For superior quality and merit.  
 1391. CASISSA and Sons, Novi (Alexandria)—Raw silk. For superior quality and merit.  
 1393. CERIANA, Brothers, and Noe, Turin—Raw and thrown silk. For superior quality and merit.  
 1395. CHICHIZOLA, G., and Co., Genoa—Velvets, very good show in black and colours. For superior quality and merit.  
 1404. CORTI, Bros., Milan—Raw and thrown silk and cocoons. For superior quality and merit.  
 1493. DE CIANI, D., Trento (Tyrol)—Raw and thrown silk. For superior quality and merit.  
 1409. DE FILIPPI, Merzagora, and Co., Arona (Novara)—Silk carded waste, also spun silk yarn. For superior quality and merit.  
 1411. DELPRINO, M., Vesime (Alexandria)—Raw silk. For superior quality and merit.  
 1413. DENEGRI, G. B., Novi (Alexandria)—Raw and thrown silk, cocoons and silk waste. For superior quality and merit.  
 1414. DEVINCENZI, G., Notaresco (Abruzzo Ulteriore)—Raw silk. For superior quality and merit.  
 1415. DITTAIUTI, Count G., Osimo (Ancona)—Raw silk. For superior quality and merit.  
 1421. FRANCHI, Brescia—Raw and thrown silk. For superior quality and merit.  
 1423. GALATTI, G., Messina—Raw silk and cocoons. For superior quality and merit.  
 1424. GAYAZZI, P., Milan—Raw and thrown silk, especially Japan and China. For superior quality and merit.  
 1497. HALLAM, T., Reggio (Calabria Ulteriore)—Raw silk. For superior quality and merit.  
 1499. IMPERATORI, G., and Sons, Intra (Novara)—Thrown silk. For superior quality and merit.  
 1430. KELLER, A., Turin—Raw and thrown silk. For superior quality and merit.  
 1432. LARDINELLI, B., Osimo (Ancona)—Raw silk. For superior quality and merit.  
 1434. LEVINSTEIN and Co., Milan—Sewing silk dyed in every colour. Superior quality and merit.  
 1454. PIATTI and Co., Piacenza—Raw silks and velvet. For superior quality and merit.  
 1458. PIZZORNI, A. M., Genoa—Raw and thrown silk. For superior quality and merit.  
 1469. PORRO, Pietro, Milan—Raw and thrown silk. For superior quality and merit.  
 1463. RONCHETTI, Brothers, Milan—Raw and thrown silk. For superior quality and merit.  
 1464. ROSSI MAFFIO, G. M. and F., Bros., Sondrio—Raw silk, and raw silk with firm double cocoons. For superior quality and merit.  
 1468. SALARI, D., Foligno (Umbria)—Raw silk. For superior quality and merit.  
 1477. STEINER and Son, Bergamo—Raw and thrown silk. For superior quality and merit.  
 1479. TALLACCHINI, Bros., Milan—Raw and thrown silk. For superior quality and merit.  
 1508. VERZA, Bros., Milan—Raw and thrown silk. For superior quality and merit.  
 1488. ZUPPINGER, SIBER and Co., Bergamo—Raw and thrown silk. For superior quality and merit.

## HONOURABLE MENTION.

1368. ANDREIS, V., Racconigi (Cuneo)—For raw silk.  
 1369. ARCANGIOLI, A., Pistoja (Florence)—For raw silk.  
 1371. ASSOM, Bros., Vila-Ballone (Turin)—For raw silk, cocoons, &c.  
 1372. BALDINI, L., Perugia (Umbria)—For raw silk.  
 1373. BANCALARI, G., Chiavari (Genoa)—For raw silk.  
 1380. BERETTA, Bros., Brescia—For silk.  
 1382. BERTARELLI, C., Cremona—For raw silk.  
 1383. BEVILACQUA, M., and Son., Lucca—For raw silk and manufactures.  
 1399. COMBONI, Bros., Limone (Brescia)—For raw silk.  
 1402. CONTI, F., Milan—For raw and thrown silk.  
 1406. CRESTINI, D., Asinalunga, Siena—For raw silk.  
 1407. DE ANTONI, C., and Co., Milan—For carded silk waste.  
 1408. DE FERRARI, Bros., Genoa—For velvets.  
 1494. DE FERRARI, G., Genoa—For velvets.  
 1410. DE GORI, Count, A., Siena—For raw silk.  
 1495. DIANA, Marquis Giacomo, Modena—For raw silk and cocoons.  
 1417. FERRARI, F., Codogno (Milan)—For raw silk and tram.  
 1420. FOSSI and BRUSCOLI, Florence—For raw silk.  
 1422. GADDUM, E. F., Terre Pellice—For raw and thrown silks and cocoons.  
 1426. GIARDINIERI, Bros., Osimo (Ancona)—For raw silk.  
 1496. GIOVANELLI, A. and D., Pesaro (Pesaro)—For raw silk.  
 1427. GRANOZIO, D., Salemo (Principato)—For raw silk.  
 1498. HUTH, Pietro, Como—For dyed black silk.  
 1431. LANZANI, L., and Bros., Milan—For carded silk waste.  
 1434. LAZZARONI, P., Milan—For thrown silk.  
 1440. MAZZERI, P., Milan—For dyed silk in black and different colours.  
 1442. MODENA, A., Reggio (Reggio Emilia)—For raw silk.  
 1502. MOSCHETTI, G. A., Boves (Cuneo)—For raw and thrown silk.  
 1445. NIERI and LENCI, Lucca—For raw silk.  
 1446. NOVELLIS, C. G., Savigliano—For thrown silk.  
 1450. PALAZZESCHI, G., Città di Castello (Umbria)—For raw silk.  
 1451. PASQUI, Cav. Z., Florence—For raw silk.  
 1457. PIERI PECCI, Count G., Siena—For raw silk.  
 1460. PREISWERK, G. and Son., Milan—For thrown silk.  
 1466. ROTA, A., Chiari (Brescia)—For raw silk.  
 1469. SARI, B., Lucca—For raw silk.  
 1474. SOLARI, M., Chiavari (Genoa)—For raw silk and fine cocoons.  
 1506. SOLET, Bernardo, Turin—For silk stuffs for furniture.  
 1480. TESTI, L., Pistoja (Florence)—For raw silk.  
 1507. VALAZZI, Luigi, Pesaro—For raw silk.

## CLASS XXI.

WOOLLEN AND WORSTED, INCLUDING MIXED FABRICS GENERALLY.

## HONOURABLE MENTION.

1515. ANTONGINI, Bros., Milan—For fair worsted yarns.

## CLASS XXII.

WOVEN, SPUN, FELTED, AND LAID FABRICS, WHEN SHOWN AS SPECIMENS OF PRINTING AND DYEING.

## MEDAL.

1547. FOLETTI, Weiss and Co., Milan—For the superior colour of their dyed Turkey red yarn.

## CLASS XXIV.

## TAPESTRY, LACE, AND EMBROIDERY.

## MEDAL.

1564. MARTINI, E., Milan—For priests' robes, beautifully embroidered.  
 1563. MARTINI, L., Milan—For embroidery, &c., of great beauty.

## HONOURABLE MENTION.

1557. VIGANOTTI, G., Milan—For silk and cotton trimmings, a good case of coach lace, and general trimmings.  
 1569. BROGGI, D. and A., Cantu (Como)—For lace in different articles, good manufacture.  
 1560. FIESCHI CONSERVATORY, Genoa—For embroidery of various sorts, half shawl, and other articles of merit.  
 1567. TACCHINI, T., Modena—For picture embroidery.

## CLASS XXVI.

## LEATHER, INCLUDING SADDLERY AND HARNESS.

SECTION A.—*Leather and Manufactures made of Leather.*

## MEDAL.

1601. ARNAUDON, L., Turin—General superiority in all departments of dressing.  
 1607. CERESOLE, Bros., Turin—General superiority in all departments of dressing, there being a great variety of goods exhibited.  
 1593. JAMMY BONETT, M., Castellamare (Naples)—General superiority in all departments of dressing.  
 1600. MODENA TANNING COMPANY, Modena—Good manufacture generally.

## HONOURABLE MENTION.

1586. BOSSI, E., Naples—Good dyeing.  
 1588. CONSIGLI, G., Leghorn—Good buff leather.  
 1591. DONATI and Co., Siena—Good currying.  
 1592. DURIO, Brothers, Turin—Good tanning.  
 1595. ORRU, S. and G., Cagliari—Good tawed or glove leather.  
 1597. PELLERANO, G. B., Naples—Good tawed kid and lamb skins.  
 1598. PIELLA, G., Pavia—Good currying.

SECTION B.—*Saddlery and Harness.*

## HONOURABLE MENTION.

1627. LICHTENBERGER, Bros., Turin—Saddle of very creditable workmanship.

## CLASS XXVII.

## ARTICLES OF CLOTHING.

SECTION A.—*Hats and Caps.*

## MEDAL.

1651. MANTELLERO, S., Sagliana (Novara)—For soft felt in different colours, of superior manufacture.  
 1647. PONZONE, A., Milan—For flexible cocked hats.

## HONOURABLE MENTION.

1641. BELTRAMI, P., Milan—For cocked hats.

SECTION B.—*Bonnets and General Millinery.*

## MEDAL.

1658. CONTI, C., S. Jacopino (Florence)—Hats, No. 45, fine, well plaited and shaped, and of good quality.  
 1659. KUBLI, J. J., Florence—Hats. For purity of colour, excellency in plaiting, and beauty in shaping.  
 2315. NANUCCI, A., Florence—Leghorn straw hats, the capoles of perfect workmanship and beauty.

## HONOURABLE MENTION.

2316. VYSE and Sons, Prato (Florence)—Leghorn hats of good manufacture.

SECTION C.—*Hosiery, Gloves, and Clothing in General.*

## MEDAL.

1532. CROCCO and Co., Genoa—Worsted hosiery of Italian wool and yarn.  
 1670. PELLERANO, G. B., Naples—Gloves, general excellence.

## HONOURABLE MENTION.

1672. RANDACCIO, M. Cagliari—Very interesting specimen of native industry in a shawl made from the byssus of the pinna.  
 1662. ROSSI, E., Naples—Leather gloves, good.

SECTION D.—*Boots and Shoes.*

## MEDAL.

2254. BALDI, G., Florence—Very ingenious boot-trees.  
 1685. FLORENCE WORKHOUSE—Boots and shoes, for well made case of various kinds.

## HONOURABLE MENTION.

1680. BRUNO, B., Turin—Boots and shoes. Good make and cut.  
 1686. GNESI, Gaetano, Florence—Glaze Napoleons and good clogs.  
 1684. ROLANDO, A., Turin—Well made ladies' boots and shoes.

## CLASS XXVIII.

## PAPER, STATIONERY, PRINTING, AND BOOKBINDING.

SECTION A.—*Paper, Card, and Millboard.*

## MEDAL.

1703. AVONDO, Bros., Serravalle (Turin)—Writing and drawing papers.  
 1697. MAGLIA PIGNA and Co., Vaprio (Milan)—Writing and drawing papers.

## HONOURABLE MENTION.

1695. GHILIOTTI, B., Voltri (Genoa)—Hand-made paper.  
 1705. MAGNANI, G., and Co., Pescia (Lucca)—Hand-made paper.  
 1698. MARTELLI, D., Florence—Marble paper.  
 1700. PICCARDO, A., Voltri (Genoa)—Paper.  
 1702. POLI, A., Villa Basilica (Lucca)—Straw paper and pasteboard.  
 1708. SORVILLO, Isola di Sora (Naples)—Well-sized paper.  
 1709. VOLPINI, C., San Marcello (Florence)—Paper.

SECTION C.—*Plate, Letterpress, and other Modes of Printing.*

## MEDAL.

1728. NOBILE, G., Naples—For work on Pompeii.  
 1716. MECCHITARISTI MONKS, Venice—For Armenian works.  
 1729. RICHTER, Naples—For chromo-lithographic illustrations.

## HONOURABLE MENTION.

1741. CELLINI, M., Florence—Publications.  
 1747. LE MONNIER, Cav. F., Florence—Publications.  
 1717. PARIS, A., Florence—For plate printing and chromo-lithography.

## CLASS XXIX.

## EDUCATIONAL WORKS AND APPLIANCES.

## MEDAL.

- |         |  |  |  |
|---------|--|--|--|
| 1792    | }  | BONAINI, Professor, Florence—For a collection of plans descriptive of the educational and charitable institutions of Florence. |  |
| to 1798 |  |  |  |
| 2322    |  |  |  |
| 2324    |  |  |  |
| to 2332 |  |  |  |
| 2339    |  |  |  |
| 2340    |  |  |  |
| 2344    |  |  |  |
| 2346    | }  | CALENZOLI, C. and S., Florence—For his anatomical preparations in wax.   |  |
| 2348    |  |  |  |
| 2349.   |  |  |  |
| 1790.   |  |  |  |
| 1784.   |  |  | Cocchi, Professor, Florence—For a collection of the palæontology and geology of Central Italy from the Museum of Natural History at Florence.          |
| 1798.   |  |  | COMMITTEE OF MANAGEMENT OF THE CENTRAL ARCHIVES OF FLORENCE, Florence—For collections and manuscripts adapted for the study of archæology.             |
| 1788 &  |  |  | ENGINEERING SCHOOL OF TURIN, Turin—For a remarkable collection of fossils and  |
| 1003.   |  |  | crystals, and the model of a locomotive.   |
| 2318.   | }  | LAMBRUSCHINI, R., Florence—For his remarkable works on the art of instruction.   |  |
| 2336.   |  |  |  |
| 1297.   |  |  | PANIZZA, Prof., Pavia—For his works on rearing the silkworm.   |
|         |  |  | PANIZZA, Prof., Pavia—For his anatomical preparations in wax, and especially his mercurial injections.   |
| 1783.   |  |  | PARLATORE, Prof., Florence—For his methodical classification of the fine botanical collections of the Museum of Natural History at Florence.           |
| 1752.   |  |  | PENDOLA, Prof., Siena—For his works on the education of the deaf and dumb.   |
| 2320.   |  |  | POMBA, Cav., Turin Typographical Company, Turin—For his educational publications.  |
| 2323 &  |  |  | ROYAL MUSEUM OF NATURAL HISTORY AT FLORENCE, Florence—For wax models of  |
| 2327.   | botanical, zoological, and anatomical specimens. |  |  |
| 102.    | }  | SCACCHI, Prof., Naples—For his collection of chemical products illustrative of crystallography.                                |  |
| 2335.   |  |  |  |
|         |  |  | SOCIETY OF MILAN FOR THE ENCOURAGEMENT OF ARTS AND INDUSTRY, Milan—For the merit of the drawings which they exhibit, and for their labours in general. |
| 2335.   |  |  | SOCIETY OF MILAN FOR THE INSTRUCTION OF THE DEAF AND DUMB POOR, Milan—For their publications and labours in general.                                   |
| 1764.   |  |  | SUB-COMMITTEE OF BOLOGNA, Bologna—For a collection of plans descriptive of the Educational and Philanthropic Institution of Bologna.                   |
| 1750.   |  |  | SUB-COMMITTEE OF NAPLES, Naples—For their collection of educational books.   |
| 1738.   |  |  | VIEUSSEUX, Florence—For the merit of his educational books.  |
| 2350.   |  |  | VILLA, Cav. Ignazio, Florence—For his astronomical and cosmographical apparatus.   |

## HONOURABLE MENTION.

1740. BARBERA, G., Florence—For his educational publications.  
 1739. BORSARI—For his work on teaching Italian to the deaf and dumb.  
 1769. CIVELLI INSTITUTION, Milan—For their cheap geographical publications.  
 1747. LE MONNIER, Florence—For his "National Library."  
 2319. MARZULLO, Palermo—For his grammar for the deaf and dumb.  
 1786. PAVIA, University of—For the cheapness of the machine drawings exhibited by them.  
 1775. RAMO, S., Naples—For his educational publications.  
 1776. RIZZETTI, Cagliari—For several publications on hygiene.  
 2345. RONDANI, Professor C., Parma—For his entomological collection.  
 1779. VIGANO, Milan—For several educational publications.

## CLASS XXX.

FURNITURE AND UPHOLSTERY, INCLUDING PAPER HANGINGS AND  
PAPIER MACHE.SECTIONS A AND B.—*Furniture and Upholstery, Paper Hangings and  
Papier Mâché.*

## MEDAL.

1848. BARBETTI, A., and Son., Florence—Furniture. For excellence of design and workmanship.
2282. CAMPANA, Marquis, G. P., Naples—Artificial marble. For novelty and invention.
1807. CANEPA, G. B., Chiavari (Genoa)—Chiavari chairs. For novelty of invention and excellence of design.
1819. FLORENCE, Royal Manufactory of Mosaics in *Pietre-Dure*, Florence—Florentine mosaic tables, &c. For excellence of workmanship.
1821. FRULLINI, L., Florence—Walnut wood *escritoire*, style of the 14th century. For excellence of design and workmanship.
1854. GATTI, G. B., Faenza (Ravenna)—Inlaid writing table. For excellence of workmanship.
1823. GIUSTI, Prof., P., Siena—Sculptured chests, &c. For excellence of design and workmanship.
1827. LANCETTI, F., Perugia (Umbria)—Ebony table and casket inlaid with woods, &c. For good design and workmanship.
1828. LEVERA, Brothers, and Co., Turin—Various articles of furniture. For excellence of workmanship.
1832. MARTINOTTI, G. and Sons, Turin—Cornices, *escritoires*, tables and sideboards, &c. For excellence of workmanship.
1835. MONTENERI, A., Perugia (Umbria)—Marquetry views of Rome, Venice, Florence, Naples, &c. For excellence of workmanship.
1845. TORRINI, G., and VECCHI, C., Florence—Tables in Florentine mosaic. For excellence of workmanship.

## HONOURABLE MENTION.

1801. BETTI, F., Florence—Table in Florentine mosaic. For excellence of workmanship.
1803. BINAZZI, G., Florence—Real and imitation mosaic tables. For excellence of workmanship.
1810. COEN, M., Leghorn—Walnut wood sideboard. For excellence of workmanship.
1815. DESCALZI, Emanule, Chiavari (Genoa)—Chiavari chairs. For excellence of workmanship.
1816. DESCALZI, Giacomo, Chiavari (Genoa)—Chiavari chairs. For excellence of workmanship.
1818. FLORENCE WORKHOUSE, Florence—Veneered sideboard. For excellence of workmanship.
1891. GARASSINO, V., Savona (Genoa)—Inlaid wood. For good design and workmanship.
1877. LOMBARDI, A., Siena—Carved wood. For excellence of workmanship.
1829. LURASCHI, A., Milan—Billiard tables. For excellence of workmanship.
1838. ODIFREDI, G., Leghorn—Toilet and writing table inlaid. For excellence of workmanship.
1878. PARENTI, G., Volterra (Pisa)—Paper weights and alabaster vase. For excellence of workmanship.
1842. SCALETTI, A., Florence—Ebony coffer inlaid. For excellence of workmanship.
- 1861 & TANGASSI, Cav. C., and Brothers, Volterra (Pisa)—Articles in alabaster. For excellence of workmanship.
- 1882.
1860. ZAMPINI, L., Florence—For excellence of workmanship.

## CLASS XXXI.

## HARDWARE.

SECTION A.—*Manufactures in Iron.*

## MEDAL.

1907. CALEGARI, V., Livorno—For an excellent casting in iron.  
 1911. CIANI, G., Florence—For excellence of workmanship in locks.  
 1916. FRANCI, P., Siena—For very good work in wrought iron.

## HONOURABLE MENTION.

1902. AZZERBONI—For good workmanship of locks.  
 1900. ALFANO, A. and G., Naples—For good workmanship in bedstead.  
 1903. BALDANTONI, G. B., Ancona—For good workmanship in bedsteads.  
 1906. BOLZANI, S., Milan—For wire gauze of good quality.  
 1914. FLORENCE WORKHOUSE—For good workmanship in chairs, bedsteads, &c.  
 1946. KRAMER and Co., Milan—For good manufacture of lead pipes.  
 1920. MACRY, HENRI and Co., Naples—For fine hollow castings in iron of heads of figures.  
 1924. PIETREARSA ROYAL IRON WORKS, Naples—For good ornamental castings.  
 1925. RUSCONI, A., Brenio (Brescia)—For plough shares.  
 1926. SIMION, G., Pescia (Lucca)—For good workmanship in frames.

SECTION B.—*Manufactures in Brass and Copper.*

## MEDAL.

1941. GIANI, V.—For the fine conception of a large statue cast at the Royal Arsenal of Turin.

## CLASS XXXII.

## STEEL.

SECTION B.—*Cutlery and Edge Tools.*

## MEDAL.

1971. SELLA, L., Masserano (Novara)—Excellent assortment of cutlery.  
 1974. VILLANI, R., Campobasso (Molise)—Excellence in damascened scissors.

## HONOURABLE MENTION.

1970. SANTANGELO, S., Campobasso (Molise)—Cutlery.  
 1976. VINEIS-BARON, Brothers, Mongrando (Novara)—Scythes.  
 1977. VINEIS, C., and Bros., Mongrando (Novara)—Scythes.  
 1979. VINEIS, S., and Bros., Mongrando (Novara)—Scythes.  
 1981. VINEIS, T. V., and Nephew, Mongrando (Novara)—Scythes.  
 1975. VINEIS, G. B., Biella (Novara)—Scythes.  
 1978. VINEIS, Marmotta, Mongrando (Novara)—Scythes.  
 1980. VINEIS, Testa de Morte, Bologna—Scythes.

## CLASS XXXIII.

## WORKS IN PRECIOUS METALS AND THEIR IMITATIONS, AND JEWELLERY

## MEDAL.

2011. CASTELLANI, Rome—Specimens of archaeological jewels. For excellence of design and workmanship.  
 1993. FORTE, E., Genoa—Filligree work. For general merit.

## HONOURABLE MENTION.

1997. GUIDA, C., Trapani—Red coral work. For general merit.  
 2360. NANNEI, G., Florence—Silver cup. For workmanship.  
 2370. PENNA, S. and C., Leghorn—Cameos. For general merit.

## CLASS XXXIV.

## GLASS.

SECTION A.—*Stained Glass and Glass used for Decoration.*

## MEDAL.

2020. BERTINI, Milan—Stained glass window. For general excellence of design, colour, and execution.  
 2015. BIGAGLIA, Cav. P., Venice—Collection of artificial aventurine and other glass. For excellence of production.  
 2018. SALVIATI, Dr. A., Venice—Collection of artificial chalcedony mosaics, enamelled and other glass works. For excellence of production.

## HONOURABLE MENTION.

2016. FRANCINI, G., Florence—Painted glass windows, style of the 14th century. For general merit.

SECTION B.—*Glass for Household Use and Fancy Purposes.*

## MEDAL.

2033. VENICE UNITED GLASS MANUFACTORIES—For excellence of manufacture of Venice beads.

## HONOURABLE MENTION.

2030. BRUNO, G., Naples—For excellence of manufacture of glass shades.  
 2032. NARDI, R., and Sons, Montelupo (Florence)—For excellence of manufacture of wine and oil flasks protected by straw.

## CLASS XXXV.

## POTTERY.

## MEDAL.

2046. GINORI LISCI, Marquis L., Florence—For reproduction of majolica.  
 2049. RICHARD and Co., Milan—For porcelain.

## HONOURABLE MENTION.

2054. CAROCCI, FABRI, and Co., Gubbio (Umbria)—For reproduction of majolica lusted ware.

## LIST OF EXHIBITORS.

---

### A.

**ABBAMONDI**, Prof. N., [76](#)  
**Abbate**, G., [803](#)  
**Abbate**, G., [365](#), [366](#)  
**Abbate**, P., [267](#)  
**Acerbi**, G., [24](#)  
**Acquadio**, B., [207](#)  
**Acquaviva**, Cav. C., [269](#)  
**Adragna**, G., [75](#), [89](#)  
**Affanni**, L., [366](#)  
**Agazzotti**, A. F., [134](#), [163](#)  
**Agnello**, Baron, [144](#)  
**Agneni**, E., [366](#)  
**Agnini**, T., [147](#)  
**Agogna and Brovello Mining Company**, [29](#)  
**Agudio**, T., [194](#)  
**Aicardi**, L. C., [159](#)  
**Aiello**, S., [236](#)  
**Ala**, A., [365](#)  
**Albani**, [38](#)  
**Alberti**, F., [71](#)  
**Albertoni**, J., [371](#)  
**Albani**, Cav. F., [157](#)  
**Albani-Tomei**, F., [65](#)  
**Albino**, P., [138](#)  
**Aldisio**, G., and Co., [16](#), [226](#)  
**Aldrovandi**, M., [76](#)  
**Aleppi**, L., [242](#), [290](#)  
**Algeri** (See **Rocca**, **Rinaldi**, and **Algeri**), [354](#)  
**Agnello**, Baron, [144](#)  
**Alessi**, G., [151](#)  
**Alexandria Penitentiary establishment**, [242](#)  
**Alexandria**, Sub-committee of, [88](#)  
**Allemano**, Brothers, [131](#)  
**Alfani**, C., [169](#)  
**Alfano**, A. and G. B., [350](#)  
**Algosino**, S., [89](#)  
**Alinari**, Brothers, [233](#)  
**Almerici**, Marquis G., [134](#)  
**Alonzo**, A., [143](#)  
**Aloysio-Juvara**, T., [370](#), [375](#)  
**Altoviti d'Avila**, Cav. F., [218](#)  
**Ambrogio**, G., [340](#)  
**Ambrosini**, G., [355](#)  
**Amicarelli**, V., [121](#), [156](#)  
**Amici**, Cav. G. B., [231](#)  
**Amiconi**, B., [366](#)  
**Anderloni**, P., [375](#)  
**Andreis**, V., [264](#)

**Angelini**, T., [371](#)  
**Anghirelli**, G., [136](#), [218](#)  
**Angiolillo**, G., [346](#)  
**Annunziata Girls' School**, [319](#)  
**Anselmi**, **Bercanovich** M., [131](#)  
**Antongini**, Brothers, [274](#)  
**Antonini**, G., [371](#)  
**Anzalone**, F., [106](#)  
**Anzi**, Cav. M., [181](#)  
**Appiani**, A., [367](#)  
**Appiani**, André, junr., [367](#)  
**Appiani and Ducci**, [296](#)  
**Arcangioli**, A., [268](#)  
**Archives**, Central, Tuscan, [329](#)  
**Arcozzi**, M. L., [305](#)  
**Aresu**, S., [90](#)  
**Arezzo**, Sub-Committee of, [96](#)  
**Argenti**, G., [371](#)  
**Ariano**, G., [237](#)  
**Armao**, G., [218](#), [362](#)  
**Arnaudon**, Prof. G., [166](#), [167](#)  
**Arnaudon**, L., [286](#)  
**Arpini**, Cav. E., [159](#)  
**Arranga**, G. A., [88](#), [138](#), [159](#)  
**Arrosto**, G., [73](#), [76](#)  
**Ascoli**, A., [267](#)  
**Ascoli**, Sub-Committee of, [98](#), [163](#), [166](#)  
**Asquer**, Cav. A., [72](#)  
**Asquer** (Visconte d'Flumini), [144](#)  
**Assom**, Brothers, [265](#)  
**Astengo**, C., [110](#)  
**Astengo**, Brothers, [184](#)  
**Astorri**, M., [289](#)  
**Atenolfi** (Prince of Castelnuovo), [218](#), [218](#)  
**Augias**, S., [166](#)  
**Avellino** (Sub-Committee of), [177](#), [286](#)  
**Aventi**, Count F. M., [247](#)  
**Avolio and Son**, [353](#)  
**Avondo**, Brothers, [296](#)  
**Aymerich** L., [107](#), [177](#)  
**Azeglio**, M. D., [367](#)  
**Azzerboni**, C., [346](#)  
**Azzi**, Brothers, [291](#)

### B.

**BACCANI**, G., [364](#)  
**Bacci**, F., [66](#), [218](#), [338](#), [362](#)  
**Baccini**, G., [180](#)  
**Bacciolani**, L., [210](#)  
**Bachini-Rossi**, L., [270](#)

- Baffico, A., 278  
 Baffoni, V., 163  
 Baldantoni, Brothers, 212, 347  
 Baldi, G., 291  
 Baldini A., 286  
 Baldini, L., 267  
 Ballor, G., 147  
 Balsamo, G. N., 151  
 Bancaldri, G., 265  
 Bancalari, L., 157  
 Bandieri, G., 232  
 Barabino, C., 364  
 Baracco, Brothers, 80, 98, 118, 159, 182, 255  
 Baracco, M. and Son, 265  
 Baracco, N., 131, 147  
 Baratelli, Baron, 247  
 Barbagallo, S., 40, 143, 165, 184  
 Barbaro, L., 289  
 Barbato, N., 159  
 Barba-Troyse, G., 37, 67  
 Barba-Troyse, V., 177  
 Barbensi, G., 335  
 Barbera, G., 297  
 Barbera, R., 371  
 Barberis, A., 237, 347  
 Barbetti, Brothers, 340  
 Barbetti Santi, 120  
 Bargiani, F., 351  
 Bargioni, G., 212  
 Bari, Sub Committee of, 147  
 Barone, Brothers, 88  
 Barozzi, A., 261  
 Bartolini, C., 139, 159, 170  
 Bartolini, F., 255  
 Bartolini, L., 371  
 Bartollotti, G., 342  
 Bartollozzi, F., 375  
 Barucco, F., 367  
 Basili, G. B., 366  
 Bassetti, A., 278  
 Bastoni, V., 163  
 Battaglia, G., 199  
 Bavassano, G. B., 265  
 Bazziger, L. and Co., 147  
 Beccalossi, F., 347  
 Becchini (See Maggi Santi and Becchini), 67  
 Belella, E., 159, 165  
 Belisario, C., 291  
 Bellella, G., 166  
 Bellentani, G., 111, 115, 150  
 Bellessini, Brothers, 90  
 Belletti, G., 271  
 Belli, P., 353  
 Bellia, S., 76  
 Bellini, G., 267  
 Bellino, Brothers, 265  
 Bellucci, G. B., 134  
 Beltrami, Count P., 19, 29, 33, 38, 42, 68, 102, 118, 177, 219, 362  
 Beltrami, G., 237  
 Beltrami, P., 226, 291  
 Beltrani, G., 66, 73, 108, 139, 159, 175, 219  
 Bendinelli, Castiglione, 131  
 Benedetti, Brothers, 111  
 Bensì, C., 338  
 Bensoni, A., 338  
 Bentivoglio, Cav. C., 181, 219, 297  
 Benvenuti, P., 367  
 Benzi, T., 180  
 Beretta, Brothers, 261  
 Beretta, C. D., 267  
 Bergami, P., 88, 118, 134, 247  
 Bergamo (Sub-Committee of), 184  
 Berizzi, S., 261  
 Bernadusi, A., 247  
 Bernard, A., 206, 284  
 Bernardi, Brothers, 112  
 Bernardi, F., 136, 167  
 Bernardi, P., 226  
 Bernardini (See Morgantini and Bernardini), 359  
 Bernardoni, G., 297  
 Bernasconi, P., 371  
 Berselli, C., 286  
 Bertarelli, C., 261  
 Berte and Strobel, 363  
 Bertelli, G., 210  
 Bertelli, L., 246  
 Bertero and Galla, 250  
 Berti, A., 291  
 Berti, F., 147  
 Berti, G., 367  
 Berti, P., 198, 289  
 Bertinara, G., 237, 347  
 Bertini, —, 337  
 Bertini, G., and Bros., 367  
 Bertone de Sambuy, E., 182, 211, 255  
 Bettarini, L., 364  
 Betti, F., 335  
 Betti, L., 139  
 Bevilacqua, M., 268  
 Bevilacqua, P., 226, 347  
 Bezzi, A., 371  
 Biancavilla, Municipality of, 172  
 Bianchi, A., 371  
 Bianchi, Agricultural Institute, 69  
 Bianchi, Bros., 112  
 Bianchi, D., 271  
 Bianchi, P., 364  
 Bianchini, G., 335  
 Bianconcini, L., 302  
 Biavati, P., 247  
 Bibiano, Municipality of, 119  
 Bifezzi, G., 231  
 Biffi, P., 118, 120, 147  
 Bigaglia, P., 336, 359  
 Billotti, Dr. P., 339  
 Binazzi, G., 335  
 Binda, A., 291, 226, 271  
 Binda, Grugnolia and Co., 180, 291  
 Biraghi and Co., 43  
 Biscari, Prince of, 172  
 Bisi, —, 253  
 Bisi, G., 367  
 Bisi, L., 367  
 Boano (see Borello and Boano), 206  
 Boarding School, 367  
 Boccacchini, A., 236  
 Boccoardo, Brothers, 89, 139, 159  
 Bocchia, E., 340

Bodino, L., [120](#)  
 Bofondi, C. P., [88](#)  
 Boissy (de) Marchionessa F., [63](#)  
 Bolgé, T., [199](#), [236](#), [252](#), [286](#), [347](#)  
 Bollini, G., [115](#)  
 Bollini, P., [296](#)  
 Bolmida, Brothers, [265](#)  
 Bologna, A., [375](#)  
 Bologna, Agricultural Society of, [90](#), [245](#),  
     [246](#), [247](#), [248](#), [249](#)  
 Bologna, Mineralogical Society, [24](#)  
 Bologna, Mint, [357](#)  
 Bologna, Provincial Deputation, [76](#)  
 Bologna, Royal Tobacco Manufactory, [151](#)  
 Bologna, Sub-Committee, [305](#)  
 Bolognini, R., [263](#)  
 Bolzani, S., [347](#)  
 Bonaini, F., [332](#)  
 Bonelli, G., [199](#), [232](#)  
 Bonini, M., [278](#)  
 Bonnet, G., [134](#)  
 Bonolis, F., [139](#)  
 Bonora, A., [249](#)  
 Bonsignori, F., [364](#)  
 Borani, Cav. C., [226](#), [353](#)  
 Borano, A., [118](#)  
 Boratto, D., [131](#), [151](#)  
 Borella and Boano, [206](#), [215](#)  
 Borello, Brothers, [291](#)  
 Boriasca, T. C., [32](#)  
 Borlasca, C., [132](#)  
 Borsari, —, [314](#)  
 Bortolotti, P., [79](#)  
 Borzino, —, [377](#)  
 Borzone, G., [255](#)  
 Boscarelli, A., [116](#)  
 Bosi, E., [335](#)  
 Bosio, F., [242](#)  
 Bosio, F. and Co., [242](#), [274](#)  
 Bosio, Widow D., [115](#)  
 Bossi, O., [286](#), [291](#)  
 Bossi, L., [199](#)  
 Bossoli, C., [370](#)  
 Botarelli, P., [303](#)  
 Botteghi, A., [157](#)  
 Botter, Prof. L., [211](#), [245](#), [246](#), [247](#), [248](#),  
     [249](#), [253](#)  
 Botti, A., [132](#), [157](#)  
 Bottinelli, A., [372](#)  
 Bottino, Mining Company, [30](#)  
 Bottoni, C., [73](#)  
 Bougleux, F., [67](#), [202](#)  
 Bouquet, (see Società Serpieri and Bou-  
     quet)  
 Bourlon and Co., [17](#)  
 Bozzino, U., [297](#)  
 Bozzo, M., [151](#)  
 Bozzotti, C. and Co., [261](#)  
 Brachetti, G., [291](#)  
 Braggio, Count F., [132](#)  
 Brande, S., [177](#)  
 Brasini, Brothers., [76](#), [121](#)  
 Brassini, D., [291](#)  
 Brescia, Athenæum of, [63](#)  
 Brescia, Social Manufactory of Arms, [227](#)

Brescia, Sub-committee, [131](#)  
 Briglio, N., [364](#)  
 Brilla, A., [340](#)  
 Brindisi, Sub-committee, [175](#)  
 Briziano, A., [237](#)  
 Broggi, A. and D., [278](#)  
 Brunetti, G., [206](#)  
 Bruni, F., [261](#)  
 Bruno, G., [291](#)  
 Bruno, G., [359](#)  
 Brusa, G. B., [221](#), [344](#), [362](#)  
 Bruscoli (see Fossi and Bruscoli), [269](#)  
 Bucci, G., [64](#)  
 Bucci, R., [342](#)  
 Buelli, E., [131](#)  
 Buffi, G., [347](#)  
 Buggiano, A., [180](#)  
 Buono, (del) E., [89](#)  
 Buresti, F., [26](#)  
 Burgarella, A., [40](#), [167](#)  
 Bussolati, Brothers, [183](#)  
 Buzzi, L., [371](#)

## C

CACCIALLI, G., [364](#)  
 Cadoni, A., [144](#)  
 Cagliari, Royal Excise Office, [151](#)  
 Cagliari, Sub-Committee, [64](#), [66](#), [72](#), [73](#), [75](#),  
     [77](#), [102](#), [112](#), [115](#), [145](#), [156](#), [162](#), [163](#), [166](#),  
     [170](#), [185](#), [186](#), [211](#), [255](#), [274](#), [355](#)  
 Caimi, E., [309](#)  
 Caimi, T., [131](#)  
 Calamaj, B., [361](#)  
 Calamatta, L., [370](#), [375](#)  
 Calamini, and Co., [243](#), [274](#)  
 Calandra, C., [278](#)  
 Calandrini, Prof. P., [178](#)  
 Calderai, A., [115](#)  
 Calegari, V., [347](#)  
 Calenzuoli, C. and S., [309](#)  
 Cali, A., [371](#)  
 Cali, C., [3](#)  
 Cali, G., [371](#)  
 Calvetti, A. G., [362](#)  
 Calvi, G., [354](#)  
 Calza, A., [220](#)  
 Calza-Kramer, G., [43](#)  
 Calzarossa, M., [291](#)  
 Camarata-Scovazzo, B., [89](#)  
 Cambini, E., [211](#)  
 Camilletti, A., [350](#)  
 Campagna, P., [269](#)  
 Campana, I., [271](#)  
 Campana, I. and F., [243](#), [275](#)  
 Campana, Marq. G. P., [222](#)  
 Campi, G., [183](#), [200](#), [202](#)  
 Campisi, A., [71](#)  
 Campobasso, Sub-Committee of, [73](#), [113](#), [177](#),  
     [253](#), [291](#), [347](#)  
 Campolonghi, G. B., [147](#)  
 Campra, C., [275](#)  
 Canaletto, A. C., [367](#)  
 Canella, G., [367](#)  
 Canepa, G. B., [344](#)  
 Canosa, Municipality of, [139](#), [159](#), [175](#)

- Canova, A., 371  
 Cantalamessa, A., 132  
 Cantalamessa, L., 159  
 Canti, G., 297  
 Cantieri, G., 342  
 Canton, G., 148  
 Cantone, S., 364  
 Cantoni, C., 242  
 Cao de S. Marco, Count. E., 103  
 Capasio, P., 113  
 Capon, G., 286  
 Caporali, T., 66  
 Cappelli, Cav., 89  
 Capretti, P., 287  
 Caproni, G., 221  
 Cappurro, Nicolo, 298  
 Capurro, G. F., 303  
 Cara, G., 145  
 Carafa di Noja, P., 218  
 Caramora, P., 132, 148  
 Carasco, G., 79  
 Carbone, F., 106  
 Carducci, A., 159  
 Carina, Cav. A., 77  
 Carina, D., 243  
 Carocci, Fabbri, and Co., 362  
 Carpaneto and Ghilino, 116  
 Carradori, G., 267  
 Carro, M., 185, 221  
 Carrobi, Giulio, 184  
 Carutti, Gaetano, 304  
 Casali, Antonio, 110  
 Casaltrinita, Mayor of, 139, 160  
 Casazza, Cav. Andrea, 90, 134  
 Casella, G., 309  
 Caserta, Botanical Gardens, 98  
 Caserta, Sub-Committee, 112, 139, 160, 166  
 250, 255  
 Cassisa, F. and Son, 265  
 Cassano, Francesco, 98, 189, 182  
 Cassaro, Francesco, 119  
 Cassani, E., 231, 351  
 Cassola, C., 90  
 Castagnacci, A., 79  
 Castagnino, Ignazio, 135  
 Castellana, Count of, 269  
 Castellani, —, 353  
 Castelli, C., 275  
 Castelli, G., and Abbate, G., 366  
 Castiglione delle Stiviere Local Committee  
 of, 151  
 Castiglioni, Pietro, 305  
 Castorina, —, 165  
 Castrocaro, —, 77  
 Casuccini, Pietro, 213, 231  
 Catalano, 364  
 Catania, Municipality of, 172  
 Catania, Sub-Committee of, 180  
 Catanzaro, Sub-Committee of, 171  
 Catoresi, F., 287  
 Cattaneo, A., 367  
 Cattaneo, G. B., 167  
 Cavalieri, P., 251  
 Caviglione, R., 291  
 Cecchetti, P., 351  
 Cecchini, 367  
 Cecconi and Santeni, 268, 274  
 Celi, Ettore, 107  
 Cellini, Mariano, 298  
 Cena, G., 342  
 Ceresole, Brothers, 287  
 Ceriana, Brothers, 265  
 Cerie, C., 351  
 Cernuschi, Brothers, 292  
 Cerrone, Giuseppe, 139  
 Certani, Annibale, 210, 246, 248, 249  
 Cesari, G., 347  
 Cesari, Luigi, 112  
 Cesena, Camillo, 139  
 Cesena, Malatestian Library, 327  
 Cetti, Giuseppe, 178  
 Chabanon, A., 271  
 Chalou and Etienne, 342  
 Chapusot, —, 232  
 Chelli, Francesco, 110  
 Cherici, Clelia, 103, 145  
 Cherici, G. and Brothers, 338  
 Cherici, N., 96, 136, 166, 178, 180  
 Chiapella, F. M., 234  
 Chiarini, P., 90  
 Chiavari, Economic Society, 67  
 Chiavenna, Sub-Committee of, 220  
 Chierici, A., 367  
 Chieti, Sub-Committee of, 98  
 Chighizola, G. and Co., 271  
 Chiossine, E., 375  
 Chirossoni, D., 375  
 Chisoli, A., 183, 261  
 Chistri, L., 25  
 Ciacchi, G., 342  
 Cianfanelli, N., 367  
 Cianferoni, A., 206, 275  
 Ciani, G., 347  
 Ciani, Giovanni, 139  
 Ciapetti, B., 210  
 Cicchese, P., 110  
 Cicchese, R., 112  
 Cicognini Royal Lyceum, 319  
 Cina, G. B., 347  
 Cioni, L., 287  
 Cioppi, Brothers, 112  
 Ciuti, N. and Son, 71  
 Civelli (Institution), 305  
 Civinini, L., 268  
 Clarkson, S. V., 143  
 Clascuse Library, 327  
 Clemente, B., 292  
 Cobiainchi, L., and Ardizzoli, G., 132  
 Cobiainchi, P. and Son, 242  
 Cobiainchi, V., 347  
 Cocchi, Brothers, 66, 219  
 Cocchi, F., 148  
 Cocchi, Prof. I., 3, 17, 309  
 Cocchi, P., 372  
 Cocozza, C., 139  
 Coda, N., 367  
 Codigoro, Municipality of, 185  
 Coen, M., 340  
 Cojari, V., 26, 77, 136  
 Cojoli, E., 27, 42

Coletta, A., [139](#)  
 Coletti, M., [340](#)  
 Collenza, E., [139](#)  
 Collier, D., [271](#)  
 Colombo, C. M., [227](#)  
 Colombo, F., [266](#)  
 Colombo, N., [360](#)  
 Colonnese, F. and G., [221](#), [362](#)  
 Comerio, Brothers, [227](#)  
 Comi, R., [80](#)  
 Comienti, G., [302](#)  
 Cominazzi, M., [227](#)  
 Commission for the Royal Italian Exhibition, 1861, [305](#)  
 Commission, R. I., for the Exhibition of London, [227](#), [353](#)  
 Communal Schools, Florence, [320](#)  
 Conrotto, C., [202](#)  
 Conservatorio dello Montalve, [320](#)  
 Cousigli, G., [287](#)  
 Consiglio, M., [108](#)  
 Contessini, F., and Co., [73](#)  
 Conti, Aldebrandi, and Co., [267](#)  
 Conti, B., [136](#), [157](#)  
 Conti, C., [292](#)  
 Conti, E., [165](#)  
 Conti, F., [261](#)  
 Coppi (See Sloane, Halle, and Coppi), [27](#)  
 Coppoli, Marquis Ranieri, [138](#)  
 Coppolo, A., [269](#)  
 Cora, D., and Son, [289](#), [363](#)  
 Corbellini, Q., [372](#)  
 Corbi Zocchi, C., [69](#)  
 Corna, G., [261](#)  
 Corneliani, L., [14](#)  
 Corridi, G., [73](#), [79](#), [148](#)  
 Corri di P., [342](#)  
 Corsi, T., [357](#)  
 Corsini, E., [167](#)  
 Corsini, L., [80](#)  
 Corti, Brothers, [261](#)  
 Corti, C., [372](#)  
 Corti, D., [206](#)  
 Cosentino, S., [165](#)  
 Cossu, P., [30](#)  
 Costa, A., [338](#)  
 Costa, G., [255](#)  
 Costa, P., [372](#)  
 Costantino, G., [106](#), [119](#), [160](#), [182](#), [275](#)  
 Costantino, T., [255](#)  
 Costanzo, Spina, A., and Son, [40](#)  
 Costarelli, M., [143](#)  
 Cozza, Count, G., [263](#)  
 Cremona, Sub-Committee, [173](#)  
 Cremoncini, A., [243](#), [278](#)  
 Crestini, D., [269](#)  
 Crica, P., [372](#)  
 Crippa, L., [108](#)  
 Cristofani, P., [271](#)  
 Crivelli, C., [67](#)  
 Crocco, C. and L., [276](#)  
 Croff, G., [372](#)  
 Croppi, C., [77](#)  
 Crossetti, P., [212](#)  
 Cucchi, T., [135](#), [183](#)

Cucchiatti, C., [278](#)  
 Cugusi, E., [77](#)  
 Curioni, G., [14](#), [36](#)  
 Curletti, A., [72](#), [73](#)  
 Curletti, L., [287](#)

## D.

D'ALESSIO, G., [167](#)  
 Dal Negro, P., [372](#)  
 D'Ambrogio, L., [139](#), [160](#)  
 D'Ambrosio, V., [139](#)  
 Damiani, C., [112](#)  
 Damioli, S., [14](#)  
 Danielli and Fillippi, [157](#)  
 D'Antoni, A., [367](#)  
 D'Antonio, S., [139](#)  
 Danza, D., [89](#)  
 Danza, G., [89](#)  
 Danzetta, Barons, Brothers, [159](#)  
 De Angelis, A., [292](#)  
 De Angelis, F. and F., [253](#)  
 De Angelis, M., [139](#)  
 De Antoni, C., [262](#)  
 De Bellis, G., [73](#)  
 De Benedetti, Brothers, [292](#)  
 De Biase, G., [160](#)  
 De Cambray Digny, G., [210](#)  
 Decanini, C., [234](#)  
 De Cesare, A., [160](#)  
 Deciani, D., [262](#)  
 Decoppet, L., [350](#)  
 De Fabritiis, Brothers, [287](#)  
 De Fazzi, F., [212](#)  
 De Ferrari, Brothers, [271](#)  
 De Ferrari, G., [271](#)  
 De Fidio, G., [89](#)  
 De Filippi, Merzagora, and Co., [262](#)  
 De Gaetano, F., [112](#)  
 De Giudici, F., [96](#)  
 De Gori, A., [119](#), [137](#), [157](#), [184](#), [269](#)  
 Dei, F., [202](#)  
 Deida, A., [287](#)  
 Delapierre, F., [200](#)  
 Del Buono, E., [89](#)  
 De Leo, A., [89](#)  
 Del Greco, F., [69](#)  
 Delia, P., [292](#)  
 Delisi, B., [372](#)  
 Della Beffa, G., [305](#)  
 Della Beffa, T., [212](#)  
 Della Bella, D., [140](#), [159](#)  
 Della-Morte, F., [350](#)  
 Della Piane, L., [344](#)  
 Della Valle, P., [221](#), [342](#), [356](#)  
 Delle Piane, (see Gelli and Delle Piane), [211](#)  
 Dell' Erma, N., [140](#)  
 Dell' Erma, V., [108](#), [140](#), [180](#)  
 Del Meglio, L., [235](#)  
 Del Pero, G. B., [289](#)  
 Del Prino, M., [132](#), [200](#), [212](#), [220](#), [266](#)  
 Del Prino, P., [132](#)  
 Del Sere, G., [287](#)  
 Del Toscano, Marquis, [143](#)  
 De Lucca, P., [108](#)  
 De Lucca, P., [156](#)

De Martino, G., 140, 344  
 De Martino, G., 292  
 Demeo, F., 271  
 Demicheli, G. B., 132  
 De Mortillet, E. G., 220  
 Demurtas, E., 103, 119, 145  
 Denci, S., 296  
 Denegri, G. B., 132, 266  
 D'Erchia, A., 67, 160, 165, 220  
 De Rosa, P., 287  
 De Rosa, R., 80  
 De Rubertis, L., 140, 160  
 De Santis, V., 365  
 Descalzi, G., 344  
 Descalzi (See Molinari and Descalza), 272  
 Dessi, Magnetti V., 186, 292  
 De Stefano, Brothers, 227, 348  
 Desticelli, G., 132  
 Devers, G., 367  
 Devincenzi, G., 270  
 De Vita, N., 72  
 Devoto, A., 255  
 Di Blasio, F., 140  
 Diena, M. G., 267  
 Di Grossi, G., 148  
 Dilgh, E., and Co., 171, 172  
 Dini, P. A., 37  
 Di Nissa, Marq. G., 108  
 Diotaiuti, G., 268  
 Di Rignano, Marquis, 160  
 Di Toro, C., 227  
 Doderlein, Prof. P., 5  
 Dol, B., 75  
 Donati, A., 287  
 Donini, S., 186  
 Doninni Savino, 246  
 Dozzio, G., 119  
 Draghi, D., 116  
 Drammis, S., 88  
 Drouin, G., 110  
 Ducci (See Appiani and Ducci), 296  
 Dufour, Brothers, 73  
 Duina, A., 210, 348  
 Dunant, A., 165  
 Durio, Brothers, 287  
 Duroni, A., 244  
 D'Urso, F. P., 67  
 Durval, E., 71, 73

## E.

EROLI, N., 148  
 Eliseo, D., 302  
 Engineer Corps, Royal Military, 306  
 Engineering, School of Applied, 6, 23, 35, 43, 309  
 Ercolani, E., 353  
 Escoubas, M. Amalie, and Scotti, Ignace, 344  
 Excoffier, G., 226

## F.

FAA DI BRUNO, A., 213, 231  
 Faa di Bruno, F., 314  
 Fabbri (See Carocci, Fabbri and Co.)  
 Faggioli, G., 302  
 Facchini, Brothers, 251

Fallica, A., 5, 40  
 Famoli, G., 226  
 Fanni, F., 72, 115  
 Fanoli, M., 377  
 Fantacchiotti, E., 373  
 Fantini, B., 109  
 Fantini, G., 135  
 Faragli, M., 268  
 Farina, Brothers, 119  
 Fasanotti, G., 367  
 Fascia, —, 140  
 Fattorini and Moretti, 359  
 Fava and Rubiano, 132  
 Favara, Viridame V., 143, 167, 175  
 Favilli, G., 73  
 Federici, M., 37  
 Ferniani, Count A., 362  
 Ferrara, Agricultural School of, 248  
 Ferrara, R. Chamber of Commerce, 90, 116, 119, 135, 248, 251, 252  
 Ferrari, F., 262  
 Ferrari, G. B., 367  
 Ferrari, P., 367  
 Ferrarini, A., 135  
 Ferraris, C., 306  
 Ferrarotti, G., 143  
 Ferrata and Vitale, 67  
 Ferrero, G., 237  
 Ferri, Brothers, 269  
 Ferri, G., 365  
 Ferri, V., 140  
 Ferrigni, G., 252  
 Ferro, F., 31, 36  
 Ferroni, G., 80  
 Festa, G., 294  
 Fiamingo, G. B., 143, 148  
 Fiamingo, S., 102, 106  
 Fieschi, Conservatory, 278, 344  
 Fine Arts, Academy of, 333  
 Finio, L., 186  
 Finzi, M., 180  
 Fiorelli, G., 167  
 Fiorentini, G., 107  
 Fiorini, G., 287  
 Fissore, G. B., 210  
 Florence, Artistic Society of, 299, 301  
 Florence, Central Archives of the Tuscan provinces, 329  
 Florence Communal Schools of, 320  
 Florence Conservatorio delle Montalve, 320  
 Florence, Gallery of the R. Manufactory of Petre Dure, 334, 336  
 Florence, Gallery of the Uffizi, 298, 334  
 Florence, Infant Asylum, 316  
 Florence, Library of the Academy of Fine Arts, 299  
 Florence, Library of the R. Gallery of the Uffizi, 329  
 Florence, Mediceo-Laurentian Library, 328  
 Florence, Mint, 357  
 Florence, Normal Elementary School for Teachers, 322  
 Florence, Normal Schools for Girls, 321  
 Florence, Pia casa di Lavoro, 276, 293, 317, 344, 348

Florence, Podesta Palace, [333](#)  
 Florence, PP. Dominican Library, Saint-Marc, [328](#)  
 Florence, R. Depository (suppressed), [299](#)  
 Florence, R. Institution of SS. Annunziata, [319](#)  
 Florence, R. Library of the Hospital of S. Maria-Nuovo, [299](#)  
 Florence, R. Library of the Riccardi palace, [299](#)  
 Florence, R. Lyceum and Municipal Gymnasium, [321](#)  
 Florence, R. Magliabechian Library, [327](#)  
 Florence, R. Marucellian Library, [299](#), [327](#)  
 Florence, Royal Natural History, [17](#), [44](#), [51](#), [310](#), [324](#)  
 Florence, R. Palatine Library, [328](#)  
 Florence, R. Tobacco Manufactory, [151](#)  
 Florence, Signore delle Quiete Boarding School, [319](#)  
 Florence, Technical Institute, [326](#)  
 Flori, A., [38](#)  
 Florio, Brothers, [132](#)  
 Floris, Cajana, [146](#)  
 Foggia, Royal Economic Society of, [256](#)  
 Foggia, Sub-Committee of, [64](#), [99](#), [112](#), [117](#), [171](#)  
 Foico, G., [5](#)  
 Foletti, Weis, and Co., [242](#), [275](#)  
 Fontana, B., [266](#)  
 Fontana, D., [342](#)  
 Fonzoli, see Hoz and Fonzoli,  
 Forcali, G., [168](#)  
 Foresi, L., [28](#), [36](#)  
 Forli, Sub-Committee of, [38](#), [43](#), [72](#), [108](#), [116](#), [135](#), [220](#), [248](#)  
 Fornara, G., [200](#), [348](#)  
 Fornari, Brothers, [288](#)  
 Fornatella, Farm of, [137](#)  
 Forni, A., [116](#)  
 Forni, G., [235](#)  
 Forniti, F., [140](#)  
 Fornovo, Local Committee, [44](#)  
 Forte, E., [353](#)  
 Fosella, G., [375](#)  
 Fossati, A. M., [292](#)  
 Fossi and Bruscoli, [269](#)  
 Foti, S., [77](#)  
 Franceschi, E., [340](#)  
 Franchi, Brothers, [262](#)  
 Franchi, Rocchi B., [140](#)  
 Franci, P., [348](#)  
 Franciosi, P., [157](#)  
 Francis-Fattorini and Moretti-Todi, [337](#)  
 Frael, E. and Co., [33](#), [43](#)  
 Frael (See Henfrey and Frael), [32](#)  
 Frangini, G., [337](#), [359](#)  
 Franzini, B., [119](#)  
 Frassinetti, Brothers, [256](#)  
 Fratacci, C., [234](#)  
 Frigerio, G., [200](#)  
 Frœlich, G. and Co., [167](#)  
 Frullini, L., [340](#)  
 Fuller, C., [372](#)  
 Fumeo, P., [372](#)

Fummo, M., [278](#)  
 Funajoli, L. A., [372](#)  
 Furlani, G., [165](#)  
 Furlini, G., and Co., [363](#)  
 Fusco, F., [227](#)  
 Fusco, G., [356](#)  
 Fusina, V., [195](#), [206](#), [212](#)

# G.

GABRIELE, A., [19](#), [43](#), [99](#), [119](#), [121](#), [160](#), [182](#)  
 Gaddi, P., [309](#)  
 Gaddum, G. F., [183](#), [266](#)  
 Gaetano (de) P., [139](#)  
 Gai, F., [218](#)  
 Galanti, Prof. A., [183](#)  
 Galasio, G., [113](#)  
 Galatti, G., [270](#)  
 Galeazzo, G. A., [362](#)  
 Galetti, S., [372](#)  
 Galise, V., [292](#)  
 Galli, G. F., [226](#), [275](#)  
 Galli, N., [292](#)  
 Galliani and Mazza, [79](#)  
 Gallicana, G., [64](#)  
 Galliziolo, B., [221](#)  
 Gamba, E., [367](#)  
 Gamba, P., [5](#)  
 Gambazzi, P., [286](#)  
 Gamberini, D., [802](#)  
 Ganna, S., [67](#)  
 Garassino, V., [340](#), [342](#)  
 Garau-Carter, L., [108](#), [145](#), [183](#)  
 Garavaglio, G., [375](#)  
 Garbesi, E. and A., [278](#)  
 Garelli, Dr. G., [77](#)  
 Gargiulo, L., [342](#)  
 Garnier-Valetti, F., [344](#)  
 Garrucciu, G. M., [31](#)  
 Gaspare, M., [73](#)  
 Gasparri, A., [160](#)  
 Gasparri, Anselmo, [140](#)  
 Gasse, L. and S., [365](#)  
 Gastaldi, A., [368](#)  
 Gatti, A., [114](#), [169](#)  
 Gatti, G. B., [342](#)  
 Gaudet, Petin, and Co., [20](#)  
 Gauthier, A., [206](#)  
 Gavazzi, P., [262](#)  
 Gaviano, A., [42](#), [144](#)  
 Gazotto, V., [370](#)  
 Gelli and Delle Piane, [411](#), [348](#)  
 Gennamari Ingurtosu Mining Company, [31](#)  
 Gennari, Prof. P., [5](#)  
 Genoa Saltpetre Refinery, [73](#)  
 Genoa Workhouse, [278](#)  
 Genovese Zerbi, D., [140](#)  
 Genta, P., [132](#)  
 Germani, G., [354](#)  
 Gervasio, G., [140](#)  
 Ghezzi A., and Son, [353](#)  
 Ghezzi, E., [363](#)  
 Ghibellini, D. and V., [80](#), [348](#)  
 Ghigliotti, B., [296](#)  
 Ghijo, C., [184](#)

Ghilino (See Carpaneto and Ghilino), 116  
 Ghirardi, G., 342, 344  
 Giacomelli, P., 348  
 Giambarini, A., 262  
 Giani, G., 368  
 Giani, V., 372  
 Giardinieri, Brothers, 268  
 Gicca, A., 306  
 Gigola, J. B., 370  
 Gilardini, G., 292  
 Ginnasi, Count D., 135  
 Ginnattasio, G., 275  
 Ginori-Lisci, M. L., 27, 43, 362  
 Gioeni-Trigona, V., 143  
 Gioffredi, M., 366  
 Gioja, M., 160  
 Gioja (Marquis of), Prince of Geraci, 143  
 Giordani, D., 115, 156  
 Giordano, G., 148  
 Giordano, G., 160  
 Giordano, Prof. E., 99, 256  
 Giordano, S., 237  
 Giorgini, Dr. G., 77  
 Giorgini, Prof. G., 77  
 Giovanelli, A. and D., 268  
 Giovannetti, Brothers, 292  
 Giovannetti, G., and Brothers, 186  
 Giovannini, Brothers, 66  
 Gioveni, V., 150  
 Giovine, G. B., 132  
 Giozza, G., 300  
 Girardi, M., 163  
 Girgenti, Sub-Committee of, 173  
 Giudice, G., 40, 168, 220  
 Giudice, G., 102  
 Giuliani, L., 89, 140  
 Giuliani, V., 121  
 Giuntini, O., 210  
 Giusti, N., 158  
 Giusti, P., 340  
 Glisenti and Ragazzoni, 15  
 Gnesi, G., 292  
 Gomboni, Brothers, 262  
 Gonella, Prof. T., 231  
 Gonin, F., 368  
 Gonin, G., 368  
 Gouin, L., and Co., 32  
 Gozzi, M., 368  
 Grandis (See Sommellier Grandis and Grattoni), 207  
 Granozio, D., 167, 175, 270  
 Granville, M., 342  
 Grassi, A., 108  
 Grassi, Brothers, 15  
 Grassi, F., 269  
 Grassi, P., 77  
 Grattoni (See Sommellier Grandis and Grattoni), 207  
 Gravina, D., 300  
 Gravina, M. A., 348  
 Greffi, A., 88  
 Gregorini, A., 15  
 Grimaldi, P., 206  
 Grisaldi del Taja, C., 137, 158  
 Griseti, E., 363

Grosso, E., 148  
 Guacci, F., 89  
 Guaglia, F., 300  
 Guala, G., 221, 344  
 Guarini, Count P., 135  
 Guarnaschelli, Cav. G., 131  
 Guelfi, G., 113  
 Guerra, Brothers, 64  
 Guerra, Count P. (See Museum of Physics and Natural History of Florence.)  
 Guerri, L., 97  
 Guida, Brothers, 163, 256  
 Guida, C., 356  
 Guida, G., 91  
 Guidi, C., 137, 168  
 Guidi, G. G., 300  
 Guidotti, F., 69  
 Gulinelli, Count G., 261  
 Gulli, G., 79  
 Guppy and Pattison, 19, 200, 212, 348

## II.

HAEGER, G., 270  
 Hahner and Co., 30, 36  
 Hahner, C. F., 64  
 Hall, Brothers, 218  
 Hallam, T., 270  
 Haupt, T., 6  
 Hayez, F., 368  
 Henfrey and Francel, 32  
 Henkel, L., 226, 275  
 Holmon, R., 341  
 Hoz and Fonzoli, 243, 275  
 Huber and Keller, 242, 276  
 Huth, P., 262

## I.

IDONE, G., 160  
 Impacciatore, T. A., 288  
 Imperatore, G. and Son, 262  
 Induno, G., 368  
 Ingegneri, P., 339  
 Ingurtosu (See Gennamari and Ingurtosu), 31  
 Italian Marble Company, 65  
 Ivaldi, D., 137  
 Izzo, A., 227

## J.

JACCINI, G. A., 116  
 Jachini, B., 135  
 Jacob, L., 302  
 Jacobelli, Cav. Achille, 64  
 Jacuzzi, G. B., 211, 348  
 Jaeger, G., 270  
 Jammy-Bonnet, M., 288  
 Jannicelli, M., 336, 342  
 Jervis, W. P., 17, 30, 67, 300, 306  
 Jesi, S., 270, 375  
 Jest, C., 309  
 Jorini, L., 372

## K.

KELLER, A., 266  
 Keller (See Huber and Keller)  
 Kramer and Co., 350

Kramer, E., [213](#)  
Kubly, T. T., [293](#)

L.

LABRIOLA, G., [356](#)  
Labruna, G., [227](#)  
Laderchi, A., [135](#)  
La Farina, C., [293](#)  
La Fontana (Society of), [32](#)  
Lai, L., [106](#), [108](#), [145](#)  
Lambertini, G., [116](#)  
Lambruschini, Cav. R., [304](#)  
Lancetti, F., [342](#)  
Lancia, Brothers, [116](#)  
Lancia, G., [202](#), [227](#)  
Landi, G., [227](#)  
Landuzzi, F., [278](#)  
Lanfredini, A., [368](#)  
Lanza, C., [288](#)  
Lanza, Brothers, [184](#)  
Lanzani, L. and Brothers, [262](#)  
Lanzarini, A. and Brothers, [116](#)  
Larderel (heirs of the late), [72](#)  
Lardinelli, B., [268](#)  
Lau, A., [350](#)  
Laurogos, T., [375](#)  
Lavaggi, G., [121](#)  
La Vega, F., [366](#)  
Lazzari, R., [243](#), [269](#)  
Lazzaroni, P., [262](#)  
Lecce, Sub-Committee of, [101](#)  
Lee, G., [218](#)  
Lega, M., [109](#), [223](#)  
Leghorn, Workhouse, [318](#)  
Lella, G., [143](#)  
Lembo, P. A., [112](#)  
Le Monnier, F., [300](#)  
Léoli, N., [211](#), [348](#)  
Leoncini, Brothers, [219](#)  
Leoni, A., [73](#)  
Leporatti, E., [278](#)  
Levera, Brothers, [343](#)  
Levinstein and Co., [202](#), [263](#)  
Libra, F., [174](#)  
Licata, Mayor of, [68](#)  
Licata, Municipality of, [173](#)  
Licciardello, S., [40](#)  
Lichtenberger, Brothers, and Co., [289](#)  
Ligas, A., [90](#)  
Lipari, Local Exhibitors' Committee, [6](#), [77](#),  
[108](#), [144](#)  
Lippi, A., [339](#)  
Liuzzi, B., [119](#)  
Livizanni, E., [302](#)  
Lodi, M., [368](#)  
Lodini, Brothers, [81](#), [348](#)  
Lofaro, A., [270](#)  
Lofaro, B., [72](#), [79](#), [114](#), [140](#)  
Lofaro, F., [165](#)  
Lofaro, G., [270](#)  
Lo Faso Pietrasanta, Duke of Serra di Falco,  
[300](#)  
Lollini, Brothers, [238](#)  
Lombardi, —, [140](#)  
Lombardi, A., [341](#)

Lomonaco, L. G., [160](#)  
Longhi, G., [376](#)  
Loru, A., [150](#), [167](#)  
Lualdi, E., [242](#)  
Lucca, F., [300](#)  
Lucca, Royal Tobacco Manufactory, [152](#)  
Lucca, Sub-Committee, [6](#), [97](#)  
Lucchesi, Brothers, [343](#)  
Lucera, Mayor of, [89](#), [101](#), [140](#)  
Luchini, G., [212](#)  
Luchini, G. (See Museum of Florence).  
Lucifero, T., [232](#)  
Lu6, A., [195](#)  
Lupinacci, Brothers, [119](#), [121](#), [160](#), [256](#), [275](#)  
Luraschi, A., [343](#)

M.

MACCAFERRI, L., [251](#)  
Macerata, Sub-Committee, [43](#), [77](#), [101](#), [159](#),  
[163](#), [178](#), [182](#), [268](#)  
Macry, E., and Company, [207](#), [350](#)  
Madesimo, Mineral Water Company, [77](#)  
Madonna, G., [140](#)  
Maestri, Dr. L., [310](#)  
Maffei, Cav. N., [64](#), [66](#), [168](#), [178](#), [212](#)  
Maffei, G., [81](#)  
Maffei, M. (See R. Museum of Florence)  
Mafizoli, A., [296](#)  
Maggi, Santi and Becchini, [68](#), [69](#)  
Maggioranna, F., [163](#)  
Maglia, Pigna, and Co., [296](#)  
Magnani, E., [269](#)  
Magnani, E., [296](#)  
Magnani, G., [296](#)  
Magnelli, L., [78](#)  
Magni, P., [372](#)  
Magri, D., [220](#)  
Mainardi, B., [343](#)  
Majorana, Brothers, [72](#), [102](#), [107](#), [115](#), [119](#),  
[121](#), [143](#), [148](#), [150](#), [152](#), [163](#), [165](#), [168](#), [171](#),  
[172](#), [174](#), [178](#), [184](#), [256](#)  
Majorana, G. and Tornabene, [78](#)  
Malatestian Library, [327](#)  
Malmusi, Cav. C., [68](#), [121](#), [150](#)  
Mameli, F., [103](#)  
Mancinelli, G., [368](#)  
Mancini, A., [288](#)  
Mancini, F., [368](#)  
Mancini, G., [141](#)  
Mancuso, M., [102](#)  
Mancusco, Matteo, [143](#)  
Manfredini, G., [372](#)  
Mangano, Antonio, and Son, [200](#), [271](#)  
Manganoni, L., [165](#), [184](#)  
Mangini, F., [135](#)  
Manna, E., [32](#)  
Mannelli, Galilei L., [137](#), [168](#)  
Manni, D., [160](#)  
Mantellero, S., and Brothers, [293](#)  
Manuelli, G., [232](#), [234](#), [350](#)  
Maratti, —, [178](#)  
Marble Company, Italian, [65](#)  
Marchese, C., [162](#)  
Marchese, E., [8](#)  
Marchesi, L., [368](#)

- Marchi, L., [148](#), [163](#), [212](#)  
 Marchi, P., [148](#)  
 Marchi, U., [232](#)  
 Marelli, A., [227](#)  
 Margreth, G., [148](#)  
 Mariani, Cav. N., [187](#)  
 Marietti, G., [300](#)  
 Marincola, F. and L., [270](#)  
 Marine Asylums, [315](#)  
 Marinelli, T., [350](#)  
 Marinelli, V., [368](#)  
 Marinetti, E., [112](#)  
 Marini-Demuro, D., [116](#)  
 Marini-Demuro, T., [103](#), [108](#), [121](#), [145](#), [167](#)  
 Marini, G., [72](#)  
 Marini, P., [145](#)  
 Marino, P., [271](#), [279](#)  
 Marino, P., [289](#)  
 Marko, C., [368](#)  
 Marocchetti, [375](#)  
 Maroni, M., [232](#)  
 Marozzi, E., [90](#)  
 Marra, E., [72](#)  
 Marras, F., [363](#)  
 Marsigli, G., [365](#)  
 Martelli, D., [302](#)  
 Martelli, G., [365](#)  
 Marti, R., [373](#)  
 Martini, B., [368](#)  
 Martini, E., [278](#)  
 Martini, L., [278](#)  
 Martini, L., [141](#)  
 Martinotti, G. and Son, [343](#)  
 Marzocchini, C., [289](#)  
 Marzolo, G., [235](#)  
 Marzullo, C., [314](#)  
 Masetti, Count P., [137](#), [158](#)  
 Masini, A., [223](#)  
 Masini, G., [353](#)  
 Massa, C., [132](#), [220](#)  
 Massa, Carrara, Royal Tobacco Manufactory, [162](#)  
 Massei, C., [73](#)  
 Masselli, A., [140](#), [160](#)  
 Masserana, G., [67](#)  
 Massina, L., [183](#), [263](#)  
 Massoleni, M., [67](#), [203](#)  
 Massone, Cav., M., [32](#), [90](#), [145](#)  
 Massone, G. B., [348](#)  
 Massoni and Musanti, [34](#)  
 Mastini Sciamanna, Marquis C., [157](#)  
 Matschef, C., [368](#)  
 Mattarelli, G., [222](#)  
 Mattei, A., [113](#)  
 Mayor of Recalmuto, [5](#)  
 Maziotti and Co., [87](#)  
 Mazza, E., [234](#)  
 Mazza, S., [227](#)  
 Mazza (See Galliani and Mazza), [79](#)  
 Mazzara, Municipality of, [175](#)  
 Mazzarosa, Marquis, [137](#), [168](#)  
 Mazzei, Cav. F., [333](#)  
 Mazzeri, P., [263](#)  
 Mazzuchelli, E., [79](#)  
 Mazzullo, G., [162](#)  
 Mazzurana, F., [103](#)  
 Mechitariste Friars, [300](#)  
 Mele, N. G., [83](#)  
 Melis, G. B., [72](#), [103](#), [145](#)  
 Melis, S., [34](#)  
 Melissari, F., [79](#), [114](#), [141](#), [161](#), [270](#)  
 Mellusi, G., [141](#)  
 Meloni, A., [108](#)  
 Mencacci, M., [180](#), [359](#)  
 Menfi, Municipality of, [173](#)  
 Mengazzi, F., [148](#)  
 Meoni, G., [296](#)  
 Mercatile, C. M., [89](#), [159](#), [248](#)  
 Merlini, C., [336](#)  
 Merlo, G. B., [133](#)  
 Merloni, Brothers, [135](#)  
 Merolla, S., [228](#)  
 Messina, Sub-Committee, [66](#), [72](#), [73](#), [79](#), [143](#), [162](#), [288](#), [293](#), [304](#)  
 Metallo-Technical Company, [30](#)  
 Mezzagora (See Filippi, Mezzagora, and Co.)  
 Mezzano, P., [252](#)  
 Micali, G., [338](#)  
 Migliaccio, R., [306](#)  
 Migliori, M., [351](#)  
 Milan, Blind Asylum of, [276](#)  
 Milan, Chamber of Commerce of, [92](#), [163](#), [243](#), [256](#)  
 Milan Royal Deaf and Dumb Institution, [314](#)  
 Milan Royal Lombard Scientific Institute, [183](#), [213](#)  
 Milan Royal Tobacco Manufactory, [152](#)  
 Milan, Society for the Encouragement of Arts and Manufactures in, [314](#)  
 Milazzo, Local Committee, [66](#), [114](#), [116](#), [144](#), [162](#)  
 Milella, G., [160](#)  
 Milei, A., [16](#), [232](#)  
 Miliani, F., [137](#), [158](#)  
 Minervino, M., [72](#)  
 Mines and Iron Works, Tuscan, [3](#), [16](#)  
 Minottini, G., and Lancetti, F., [228](#)  
 Minottini, G., [353](#)  
 Minotto, G., [232](#)  
 Minucci del Rosso, S., [365](#)  
 Minntoli-Segrini, Count E., [90](#), [168](#)  
 Mirabelli, F., [270](#)  
 Miralta, Brothers, [72](#), [73](#)  
 Modena, A., [267](#)  
 Modena, Curring Company of, [288](#)  
 Modena, Director of the R. Botanical Garden of, [88](#)  
 Modena Royal Tobacco Manufactory, [152](#)  
 Modena, Sub-Committee of, [92](#), [120](#), [135](#), [164](#), [178](#), [234](#), [243](#)  
 Molina, P. A., [297](#)  
 Molinari (See Moreasco and Molinari), [272](#)  
 Molinari and Descalzi, [217](#)  
 Mollica, G., [373](#)  
 Mombelli, G., [351](#)  
 Monari, C. and C., [90](#)  
 Moncada, A., [144](#)  
 Moncalvo, D., [133](#)  
 Monganoni, L., [165](#)

Mongiana, Royal Metallurgical Establishment of, [228](#)  
 Montalegre, Municipality of, [173](#)  
 Montalti, E., [186](#)  
 Monte-Altissimo Company, [64](#)  
 Montecatini Royal Thermal Establishment, [78](#)  
 Montecchi, E., [293](#)  
 Montelatici, Brothers, [336](#)  
 Montemerlo, E., [133](#)  
 Monteponi Mining Company,  
 Monterisi, G., [106](#), [141](#)  
 Montevecchio, Mining Company, [33](#)  
 Monti, E., and Co., [238](#)  
 Monti, J. (See Florence Museum of Physics and Natural History)  
 Monti, R., [373](#)  
 Montineri, A., [343](#)  
 Montini, P., [78](#), [137](#)  
 Montori, G., [101](#)  
 Morandi, L., and Son, [148](#)  
 Morelli, D., [368](#)  
 Morelli, F., [243](#), [275](#)  
 Morelli, G., [156](#), [256](#), [275](#)  
 Moreschi, J. and A., [345](#)  
 Moresco and Molinari, [272](#)  
 Moretti (See Fattorini and Moretti)  
 Moretti (See Francis-Fattorini and Moretti-Todi)  
 Moretto de Brescia, [368](#)  
 Morgantini and Benardini, [359](#)  
 Morghen, R., [376](#)  
 Mori, G., [211](#)  
 Morozzi, F., [345](#)  
 Mortini, L., [141](#)  
 Moscato, Brothers, [120](#)  
 Moscerò, G., [108](#), [161](#)  
 Moschese, C., [141](#)  
 Moschetti, G. A., [266](#)  
 Mosso, Brothers, [363](#)  
 Mozzano, Municipality of, [170](#)  
 Muggioni, A., [180](#)  
 Muraglia (See R. Museum of Florence), [66](#)  
 Muratti, A., [207](#), [228](#)  
 Mure, Brothers, [231](#)  
 Murgia, G., [145](#)  
 Murru-Murru, A., [90](#), [145](#)  
 Musanti (See Massoni and Musanti)  
 Museum, Royal, of Florence, [51](#), [66](#)  
 Musico, D., [169](#), [344](#)  
 Mussiari, G., [211](#)  
 Mussini, C., [369](#)  
 Muzzi, A., [369](#)  
 Muzzi, L., [306](#)

## N.

NALDINI, B., [158](#)  
 Nannei, G., [353](#)  
 Nannucci, A., [294](#)  
 Naples, Industrial Parthenopean Society of, [256](#)  
 Naples, Mineralogical Museum, [6](#)  
 Naples, Mint, [357](#)  
 Naples, Royal Conservatory of Carminello, [279](#)

Naples, Royal Foundry, [19](#), [173](#)  
 Naples, Sub-Committee, [19](#), [80](#), [141](#), [167](#), [173](#), [270](#), [306](#)  
 Naples, Torre Annunziata Royal Manufactory of Arms), [228](#)  
 Nardi, R., and Son, [180](#)  
 Nasi, G., [106](#)  
 Natoli, A. D., [107](#)  
 Nefetti, A., [269](#)  
 Negroni, G., [339](#), [354](#)  
 Neri, A., [90](#)  
 Nesi, A., [144](#)  
 Nesti, F., [228](#), [349](#)  
 Nicolai, P. A. (See Monteponi Mining Company)  
 Nicolini, A., [365](#)  
 Nicolini, F. and F., [365](#)  
 Niedda di S. Margherita, Count P., [107](#), [162](#), [168](#)  
 Nieri and Lenci, [269](#)  
 Nigra, G., [263](#)  
 Nissa, Marquis, [162](#)  
 Nistri, Brothers, [301](#)  
 Noberasco and Acquarone, [165](#)  
 Noberasco, L., [253](#)  
 Nocera, Municipality of, [78](#)  
 Nocito, G., [44](#), [66](#)  
 Nomis, M. G. (See Museum of Florence)  
 Norchi, E., [339](#)  
 Normal School for Teachers, [322](#)  
 Nova, D. A., [141](#)  
 Novelli, C., [266](#)  
 Novi, C., [344](#)  
 Novi, D. A., [161](#)  
 Nurchis, R., [33](#)

## O

OBIGLIO, L., [238](#)  
 Odifredi, G., [344](#)  
 Oletti, P., [234](#)  
 Olivieri and Ferro, [363](#)  
 Ollomond Mining Company, [22](#)  
 Olmetta, A., [238](#), [349](#)  
 Oreggia, C., [133](#), [158](#)  
 Orfini, Count, [65](#)  
 Orlando, G. Dr., [141](#), [161](#), [182](#), [276](#)  
 Orrigoni, A., [43](#)  
 Orru, S. and J., [280](#)  
 Orru, Salvatore, [288](#)  
 Orru, Sisinio, [121](#)  
 Orsi, A., [78](#)  
 Orsi, R., and Co., [116](#)  
 Orsini, O., [73](#)  
 Ortona, Municipality of, [149](#), [161](#), [178](#)  
 Osculati, Pirovano, and Co., [243](#), [256](#), [276](#)  
 Ottaviani, Brothers, [270](#)  
 Ottolini-Balbani, Countess C., [168](#)  
 Oudart, L., [133](#)  
 Ovada, Municipality of, [133](#)

## P

PACCA, Marq. G., [101](#), [141](#), [161](#), [182](#)  
 Paccagnini, F., [365](#)  
 Pace, V., [171](#)  
 Pacifici, Count D., [248](#)

- Pacifico, G., [141](#), [167](#)  
 Pacinotti, P., [339](#), [359](#)  
 Padiglione, F., [366](#)  
 Padoa, P., [253](#), [267](#)  
 Padovanni, Brothers, [263](#)  
 Padri Benedettini di Monte Cassino, [101](#),  
     [144](#)  
 Paganelli, E., [167](#)  
 Paganelli, L., [109](#)  
 Pagano, M. A., [141](#)  
 Paganoni, A., [249](#)  
 Paganucci, Prof. L., [307](#)  
 Pagliano, E., [376](#)  
 Pagliano, F., [133](#)  
 Palagi, P., [369](#)  
 Palazzeschi, G., [268](#)  
 Palizzi, C., [141](#), [161](#)  
 Palotta, S., [251](#)  
 Palotti, C., [251](#)  
 Palumbo, O., [106](#), [117](#), [141](#), [156](#), [169](#)  
 Palumbo, P., [110](#)  
 Pampalone, L., [374](#)  
 Pancani, Brothers, [165](#)  
 Panciatichi, Marq. X., [301](#)  
 Pandiana, A., [373](#)  
 Pandiana, G., [373](#)  
 Pane, M., [354](#)  
 Panichi, [182](#)  
 Panizza, Prof., [317](#)  
 Panizzi, M., [279](#)  
 Pantano, F. P., [106](#)  
 Paolella, G., [161](#)  
 Paoletti, F., [112](#)  
 Paoletti, G., [365](#)  
 Paoletti, G., [112](#)  
 Paoletti, O., [113](#)  
 Paparella, G., [44](#)  
 Papi, L., [341](#)  
 Paradossi, O., [217](#)  
 Parazzoli, L., [354](#)  
 Parente, C., [141](#)  
 Parente, G., [142](#)  
 Parenti, G., [338](#)  
 Paris, A., [301](#)  
 Paris and Micheloni, [228](#)  
 Parlanti, E., [279](#)  
 Parlatore, Madame E., [149](#)  
 Parlatore, Prof., [313](#)  
 Parma, National Library of, [373](#)  
 Parma, Royal Foundry, [228](#)  
 Parma, Royal Museum of Natural History,  
     [65](#)  
 Parma, Sub-committee of, [92](#), [120](#), [135](#), [288](#)  
 Parma, Veterinary College, [309](#), [326](#)  
 Parodi, P., [74](#)  
 Pascasio, V., [108](#), [117](#), [142](#), [161](#)  
 Pasi, G., [106](#), [247](#)  
 Pasolino, Cav. G., [185](#), [251](#)  
 Pasquero, G. D., [293](#)  
 Pasqui, Chev. Z., [269](#)  
 Pasqui, G., [109](#), [211](#)  
 Pasqui, Z., [269](#)  
 Pasquini, G., [344](#)  
 Pastacaldi, T., [269](#)  
 Pate, and Son, [36](#)  
 Paterno, Castello Marq. of S. Giuliano, [106](#),  
     [107](#)  
 Paterno, Castello, Princess M., [90](#)  
 Paterno, Municipality of, [172](#)  
 Patisson (See Guppy and Pattison)  
 Patrico, V., [144](#)  
 Patuzzi, L., [79](#)  
 Paulucci, Marquis G. B., [164](#)  
 Pavan (See Treves and Pavan)  
 Pavanelli, G., [92](#), [135](#), [247](#)  
 Pavia Anatomical Museum, [313](#)  
 Pavia, Physical Museum of the University of,  
     [232](#)  
 Pavia, R. University of, [238](#), [307](#), [312](#), [313](#),  
     [324](#)  
 Pedevilla, F., [220](#)  
 Pelais, G., [220](#)  
 Pelitti and Son, [236](#)  
 Pellas, C. F., [74](#), [79](#)  
 Pellegrinetti, F., [256](#)  
 Pellegrino, D., [89](#)  
 Pellerano, G. B., [288](#), [293](#)  
 Pelliccia, L., [68](#)  
 Pelloli, A., [374](#)  
 Peluffo, V., [355](#)  
 Pendola, Prof. T., [314](#)  
 Pennachi, F., [138](#)  
 Pensa, F., [185](#)  
 Penza, F., [351](#)  
 Peone, G., [293](#)  
 Perdicary, M. C. (See Royal Museum of  
     Florence).  
 Perelli, G., [65](#)  
 Perez, C., [203](#)  
 Peri, G., [79](#)  
 Perini, P., [149](#)  
 Peripetti, C., [267](#)  
 Perotti E., [369](#)  
 Perra, A., [145](#)  
 Perrata, S., [293](#)  
 Persichetti, S., [243](#), [252](#)  
 Perusino, V., [183](#)  
 Pesaro, Agricultural Academy, [18](#), [102](#), [138](#),  
     [159](#)  
 Pesaro, Agricultural Society of, [181](#)  
 Pesci, G., [159](#)  
 Pessina, J., [369](#)  
 Petin, Gaudet, and Co., [20](#)  
 Petit Bon G., [219](#)  
 Petri, G., [74](#), [79](#)  
 Petrosemilo, A., [149](#)  
 Petruccelli, C., [120](#)  
 Petrucci, A., [279](#)  
 Petti, E., [279](#)  
 Piacentini, Becchi, and Co., [288](#)  
 Piacenza, Sub-Committee of, [136](#)  
 Piana, G., [221](#)  
 Piatti and Co., [244](#), [267](#)  
 Piazzoni, G. B., [263](#)  
 Piccaluga, E., [266](#)  
 Piccaluga, G., [108](#), [178](#)  
 Piccardi, G., [187](#), [168](#)  
 Piccardo, A., [297](#)  
 Picchi, A., [341](#)  
 Picchi, P., [178](#)

- Picchio, Cav. P., [133](#)  
 Piccini, A., [280](#)  
 Piegaja, R., [222](#), [363](#)  
 Piella, G., [288](#)  
 Pieri-Pecci, Count G., [158](#), [269](#)  
 Pieroni, A., [354](#)  
 Pierotti, G., [373](#)  
 Pierotti, P., [338](#), [354](#)  
 Pierotti, U., [293](#)  
 Pietrarsa, Royal Iron Works, [207](#), [350](#)  
 Pietrarsa, Royal Railway Establishment, [196](#)  
 Pietre dure, Royal Manufactory of, [334](#)  
 Pigheti, A., [79](#)  
 Pigna (See Maglia, Pigna, and Co.),  
 Pignatelli, V., [80](#)  
 Pilla, G., [228](#)  
 Pilloni, A., [280](#)  
 Pinelli, L., [304](#)  
 Piras, M., [276](#)  
 Piras, V., [276](#)  
 Pirazzi, M. and Co., [34](#)  
 Pirolì, Prof. Andrea, [18](#), [44](#)  
 Pisa, Museum of History, Art, &c., [333](#)  
 Pisa, Sub-Committee of, [200](#)  
 Pisa, University of, [301](#), [323](#)  
 Pistilli, F., [20](#), [101](#)  
 Pistis, G., [162](#)  
 Pittau, F., [106](#)  
 Pittau, M., [106](#)  
 Più, F., [167](#)  
 Pizzetti, F., [183](#)  
 Pizzardi, Marquis, and Brothers, [212](#)  
 Pizzi, L., [142](#)  
 Pizzorni, A. M., [266](#)  
 Platania, P. and Co., [40](#)  
 Ploncheri, G., [297](#)  
 Poccianti, [365](#)  
 Podesta, B., [24](#)  
 Podesta, D., [65](#)  
 Polenghi, C., [181](#), [256](#)  
 Poli, A., [297](#)  
 Poli, G. B., [78](#), [79](#)  
 Pollera, Andrea, [297](#)  
 Ponci, S., [288](#)  
 Pondi, G., [78](#)  
 Ponticelli, G., [66](#), [182](#)  
 Ponzio, G., [133](#)  
 Ponzzone, A., [293](#)  
 Porporati, [376](#)  
 Porro, P., [263](#)  
 Porto Maurizio, Sub-Committee of, [162](#)  
 Potenziani (Heirs of), [138](#)  
 Pracchi, A., [288](#)  
 Pranicolini, A., [150](#)  
 Prandi, L., [133](#)  
 Pranzini, L., [89](#), [165](#)  
 Prati, G., [149](#)  
 Prato Orphan Asylum, [316](#)  
 Praticcio, F., [280](#), [293](#)  
 Pratto, F. (Farm of), [137](#)  
 Preiswerk, G., [263](#)  
 Primicerio, L., [270](#)  
 Prinetti, C., [369](#)  
 Priolo, P., [369](#)  
 Priora, G., and Co., [228](#)  
 Prosperini, P., [301](#)  
 Prunas, R., [146](#), [162](#)  
 Puccinelli, A., [369](#)  
 Puccinelli, M., [307](#)  
 Pugliese, A., [293](#)  
 Puliti, C., [221](#), [363](#)  
 Pupilli, G., [186](#)
- Q.
- QUADRI, E., [249](#)  
 Quartapelle, R., [43](#), [68](#), [220](#)  
 Quercioli, Brothers, [109](#)
- R.
- RABBINI, Cav. A., [307](#)  
 Racchi, Dr. G., [43](#)  
 Ragazzoni (See Glisenti and Ragazzoni)  
 Raimondi, L., [369](#)  
 Rainoldi, G., [116](#)  
 Ramirez, G., [117](#)  
 Ramo, S., [90](#), [178](#), [304](#)  
 Rampoldi, D., [272](#)  
 Rancini, C., [234](#)  
 Randaccio, M., [293](#)  
 Randacio, Prof. G., [313](#)  
 Ranoni, d'Este B., [136](#)  
 Rapisardi, M., [369](#)  
 Rappis, P., [149](#)  
 Ravenna, Academy of Fine Arts, [333](#)  
 Ravenna, Classense Library, [327](#)  
 Ravenna, Sub-committee of, [75](#), [93](#), [136](#), [267](#),  
[293](#)  
 Ravizza, G. and Brothers, [138](#)  
 Re, Carlo, [110](#)  
 Recalmuto, Mayor of, [5](#)  
 Recupero, S., [144](#)  
 Reggio (Calabria), Sub-committee, [6](#), [74](#), [120](#),  
[142](#), [161](#), [168](#)  
 Reggio (Emilia), Agricultural Committee of,  
[164](#), [179](#), [181](#), [253](#), [256](#)  
 Reggio (Emilia), Agricultural Society of, [69](#),  
[92](#), [93](#), [116](#), [164](#), [220](#), [253](#)  
 Reggio (Emilia), Sub-committee, [74](#), [78](#), [100](#),  
[186](#)  
 Rella, S., [142](#)  
 Remedi, M. A., [24](#)  
 Renucci, V., [181](#)  
 Revedin, Count G., [88](#), [120](#), [253](#)  
 Revelli, S., [374](#)  
 Riatti, V., [72](#), [74](#)  
 Ricardi, di Netro, E., [22](#)  
 Ricasoli, Baron, [137](#), [168](#)  
 Ricca, P., [374](#)  
 Riccardi-Strozzi, C., [137](#), [163](#)  
 Ricci, G., [89](#)  
 Ricci, G. B., [133](#)  
 Ricci, L., [134](#)  
 Ricci, R., [203](#)  
 Ricciani, A., [376](#)  
 Ricco, F., [301](#)  
 Richard and Co., [363](#)  
 Richards, Gaggiotti E., [369](#)  
 Ricordi, T., [301](#)  
 Ridolfi, Marquis C., [133](#)  
 Riati, Sub-committee of, [156](#), [161](#)

Righetti, — [135](#)  
 Righini, C., [345](#)  
 Righini, C., [363](#)  
 Rimini, A., [376](#)  
 Riolo, (commune of), [78](#)  
 Ripamonte, [341](#)  
 Rissone, L., [223](#)  
 Rizzetti, D. G., [307](#)  
 Rizzo, Brothers, [263](#)  
 Rizzoli, R., [252](#)  
 Roberto P., [231](#)  
 Rocca-Rinaldi and Algeri, [354](#)  
 Rocchetta, the Municipality of, [37](#)  
 Rolando, A., [233](#)  
 Romagna (Sulphur Mining Company), [38](#)  
 Roman Iron Company, [18](#)  
 Romanelli, P., [374](#)  
 Romano, F., [288](#)  
 Romeo, L., [107](#)  
 Roncalli, A., [234](#)  
 Roncati, E., [374](#)  
 Ronchetti, Brothers, [263](#)  
 Ronchi, P., [150](#)  
 Rondani, C., [314](#)  
 Rondani, T., [219](#), [232](#), [363](#)  
 Rosaspina, F., [376](#)  
 Rosellini, G., [201](#)  
 Rospiagliosi-Pallavicini (Prince of), [138](#), [158](#)  
 Rossi, A., [211](#), [247](#)  
 Rossi, F., [276](#)  
 Rossi, F. and N., [220](#)  
 Rossi, Fr. (See Museum of Florence)  
 Rossi, M. and Brothers, [264](#)  
 Rossi-Melocchi, C., [365](#)  
 Rossi, P., [201](#), [203](#)  
 Rossini, G., [268](#)  
 Rota, A., [264](#)  
 Rota and Co., [147](#)  
 Rovelli, C., [345](#)  
 Roy, P., [369](#), [370](#)  
 Rubinacci, S., [270](#)  
 Rubino, M., [89](#)  
 Rundeddu, R., [106](#)  
 Ruschi, P., [65](#)  
 Rusconi, A., [348](#)  
 Ruspini, G., [74](#), [78](#)

## S.

SABATELLI, L., [376](#)  
 Sacconi, Count E., [248](#)  
 Saggi, S., and Co., [36](#)  
 Sagliocca, G., [120](#), [142](#), [167](#)  
 Sajno, F., [213](#)  
 Sala, C., [198](#)  
 Sala, E., [369](#)  
 Sala, F., [223](#)  
 Saladini, Count M., [248](#)  
 Salani, A., [294](#)  
 Salari, D., [263](#)  
 Salari, R., [201](#)  
 Salerno, Sub-Committee of, [108](#), [116](#), [175](#)  
 Salimbeni, L., [136](#)  
 Salis, F., [145](#)  
 Salis, L., [146](#)  
 Saltarelli, A., [121](#)

Salvagnoli-Marchetti, Cav. A., [138](#)  
 Salvani, F., [376](#)  
 Salviati, A., [337](#), [354](#), [359](#)  
 Salvini, S., [374](#)  
 Samoggio, G., [116](#)  
 Sancecette, F., [342](#)  
 San Felice (Monastery of), [144](#)  
 San Francesco (Monastery of), [144](#)  
 Sangiorgio, A., [374](#)  
 Sanguinetti, F., [256](#)  
 Sanna, V., [106](#), [146](#)  
 San Placido (Monastery of), [144](#)  
 Sanrome, M., and Brothers, [201](#)  
 Sansaverino, F., [307](#)  
 Sansone, P., [161](#)  
 Sant'Agostino (Monastery of), [144](#)  
 Santa Amadia, Ruiz Augusta, [144](#)  
 Sant'Angelo, S., [348](#)  
 Sant'Anna (Hermitage of), [106](#), [144](#)  
 Santaroni, R., [142](#)  
 Santa Scholastica, [142](#)  
 Santerelli, E., [357](#)  
 Santerini, Brothers, [304](#)  
 Santi, C., [68](#), [138](#)  
 Santi (Delli) F., [161](#)  
 Santilli, B., [276](#)  
 Santini, A. E. (See Museum of Physic and Natural History of Florence),  
 Santini, G., [65](#)  
 Santini, L., [211](#)  
 Santoni, F., [288](#)  
 Santoro, G., [89](#), [142](#), [161](#)  
 Santo-Spaco, N., [142](#)  
 Santucci, P., [136](#)  
 Saraceno, V., [150](#)  
 Saragoni and Turci, [32](#)  
 Sarcina, N. R., [89](#)  
 Sardini, G., [153](#)  
 Sardinia Salt Works Company, [73](#)  
 Sargatu, P., [90](#)  
 Sari, B., [269](#)  
 Sartori, G., [341](#)  
 Satta Floris, R., [146](#)  
 Saulli, L., [161](#)  
 Savona (Local Committee), [106](#), [179](#), [219](#), [363](#)  
 Savorelli, Marquis A., [136](#), [185](#)  
 Savorini, F., [149](#)  
 Scacchi, D., [67](#)  
 Scacchi, Prof. A., [307](#)  
 Scaletti, A., [241](#)  
 Sealite, N., [134](#)  
 Scaramuzza, F., [369](#)  
 Scarglia, M., [161](#)  
 Scattola, D., [369](#)  
 Scazzola, G. D., [134](#)  
 Scerno, E., [74](#)  
 Schiantarelli, P., [365](#)  
 Schiavoni, —, [376](#)  
 Schiavoni, N., [370](#)  
 Schlaepfer, Werner, and Co., [110](#), [244](#)  
 School, Normal, for Girls, [321](#)  
 School of Applied Engineering, [6](#), [23](#), [35](#), [43](#)  
 Sciaccia (Municipality of), [173](#)  
 Sciarroni, M., [270](#)  
 Sclopis, Brothers, [20](#), [72](#), [74](#)

- Scocchera, S., 142, 161, 164, 167, 175  
 Scola, B., 80  
 Scola, G., 264  
 Scotti, L., 344  
 Scovazzo-Cammerata, B. R., 40, 89  
 Serofiano (Farm of) 138  
 Seuderi, A., 162  
 Seuderi, F. M., 149  
 Segré, S., 266  
 Scleroni, G., 374  
 Sella, Brothers, 276  
 Sella, L., 348  
 Sella, M., 276  
 Semmola, F., 179, 219, 351  
 Senocchi, G. B., 267  
 Sergi, P., 238  
 Serpieri and Bouquet Company, 34  
 Serra, A., 146  
 Serra, Dr. L., 67, 103, 146, 164  
 Serracapriola, Municipality of, 161  
 Serventi, Heirs of, 185  
 Servi, E., 279  
 Serviti, Padri, 72  
 Sesima, V., 149  
 Sestri-Ponente, R. Tobacco Manufactory, 152  
 Severi, A., 289  
 Sevoulle, B., 359  
 Siccardi, Brothers, 183  
 Sichling, A., 228, 354  
 Siculiana, Municipality of, 173  
 Signorini, Brothers, 142, 161  
 Silber (See Zupping, Silber and Co.), 325  
 Silvatici, G., 201  
 Sini, Cav. A., 65  
 Simi, M. A. (See Museum of Florence), 66  
 Simion, G., 348  
 Simoni and Sons, 297  
 Sinastra, C., 174  
 Sinigaglia, S., 267  
 Siniscalco, Brothers, 89  
 Siniscalco, M., 74, 149, 181  
 Sipriot, C., 196, 226  
 Sirigu, G., 146  
 Sisto, B. A., 40, 144  
 Sivalli, L., 377  
 Sloane, Hall, and Coppi, 27  
 Smargiassi, G., 369  
 Società Crittogamica Italiana, 181  
 Solari, M., 266  
 Solei, B., 272  
 Sommariva, B., 186  
 Sommeiller, Grandis, and Grattoni, 207  
 Sona, C., 117  
 Sorbi, L., 288  
 Sorlini, A., 264  
 Sorvillo, N., 297  
 Spano, Luigi, 20, 67, 78, 103, 112, 116, 121,  
146, 156, 162, 179, 181, 186, 211, 219, 220,  
277, 280, 349, 363  
 Spano, P., 146  
 Spaventi, P., 374  
 Spedalière, P., 272  
 Spensieri, G., 142  
 Spetrini, L., 228  
 Spezi, D., 121  
 Spezia, Brothers, 35  
 Spina, S., 349  
 Spina, S. P., 211  
 Squarci, E., 185  
 Squerzo, V., 345  
 Squinzo, L., 228  
 Staffuti, O., 208  
 Stefanelli, P., 106  
 Steinauer, G. A., 242  
 Steiner, G. and Sons, 264  
 Stichling, A., 288  
 Strazza, G., 374  
 Streiff, G. and Co., 21, 29  
 Strobel (See Berte and Strobel), 364  
 Superchi, P., 211  
 Suppia and Casolina, 74, 149  
 Surtera Sopransi, M., 264  
 Sylos Labini, V., 142, 161  
  
 T.  
 TACCHI, G. and Co., 185  
 Tacchini, T., 279  
 Taccini, Lertora, and Co., 294  
 Tagliacozza, P., 229  
 Taiani, G., 219  
 Talacchini, A., and Co., 21  
 Talamucci Santi, 289  
 Talenti, Count L., 168  
 Tallacchini, Brothers, 264  
 Tancredi, P., 37  
 Tangassi, Cav. C., and Brothers, 333  
 Tanning and Co., Modena, 289  
 Tantardini, A., 374  
 Taormina, Municipality of, 173  
 Tarantini, N., 142  
 Tarditi and Traversa, 110  
 Tarello, M., 133  
 Tari, G., 374  
 Tartaglia, G., 302  
 Tartagliozzi, G., 142  
 Tartarone, G., 73  
 Tecchi, A., 279  
 Tedeschi, L., 181  
 Tellini, V., 110  
 Tenerani, P., 374  
 Tenerelli, F., 304  
 Teodorani, S., 208, 351  
 Terzano (See Venditti and Terzano)  
 Tesi, L., 138, 164, 269  
 Tesone, P., 140  
 Tessada, F., 279  
 Tessada, G., 294  
 Tesser, G. (See Florence Museum)  
 Thomas, A., 244, 277  
 Timon, Cav. A., 43, 179, 302  
 Todi-Vecchi, 267  
 Tomei, A. F., 65  
 Tommasoni, G., 268  
 Toncini, L., 370  
 Toni, F., 183, 268  
 Tonini, Fr. (See Florence Museum, 66)  
 Torelli, D., 211, 349  
 Tornabene, F. (See Majorana and Tornabene)  
 Toro, B. P., and E., 149  
 Toro, P. A., 349

- Torre Annunziata Royal Manufactory of Arms, [228](#)  
 Torri, F., [78](#)  
 Torri, L., [88](#), [136](#), [251](#)  
 Torricelli, A., [121](#)  
 Torrini, G., and Viecchi, Carlo, [336](#)  
 Torrisi, M. A., [69](#), [74](#)  
 Toschi, A., [229](#)  
 Toschi, P., [370](#), [377](#)  
 Totoro, N., [142](#)  
 Tovazzi, C., [44](#)  
 Tovo, F., [81](#), [208](#)  
 Trafieri, A., [279](#)  
 Trapani, G., [144](#)  
 Trari, M., [354](#)  
 Travaglini, C., [229](#)  
 Travale, C., [72](#)  
 Traversa (See Tarditi and Traversa)  
 Trejaviile, A., [89](#), [142](#), [161](#)  
 Treves and Pavan, [203](#)  
 Treves, M., [223](#), [302](#)  
 Tricca, A., [370](#), [377](#)  
 Troja (Mayor of), [89](#)  
 Tron, G., [304](#)  
 Trucilli, V., [119](#)  
 Truffelli di Treviglio, [256](#)  
 Tubi, G., [238](#)  
 Turchi, L., [165](#)  
 Turchini, R., [208](#)  
 Turci (See Saragoni and Turci)  
 Turin Academy of Agriculture, [32](#)  
 Turin Academy of Medicine, [78](#)  
 Turin Engineering School, [195](#)  
 Turin General Postal Administration, [206](#)  
 Turin Mint, [357](#)  
 Turin Royal Arsenal, [229](#), [351](#)  
 Turin Royal Direction of the Cadastral Survey, [214](#)  
 Turin Royal Tobacco Manufactory, [152](#)  
 Turin Typographical Association, [305](#)  
 Turri, N., [136](#)  
 Tuscan Mines and Iron Works, [3](#), [16](#)
- U.
- Ugo, G., [172](#)  
 Ulivi, L. (See Florence Museum)  
 Ulrich, D., [134](#)  
 Ussi, S., [370](#)  
 Uva, C., [370](#)
- V.
- VACCARO, L., [164](#), [186](#)  
 Vagliasindi, F., [150](#)  
 Vairo, G., [211](#)  
 Vaiser, S., [274](#)  
 Valazza, G., [115](#)  
 Valazzi, L., [268](#)  
 Valente, P., [365](#)  
 Valeri, A., [121](#)  
 Valeri and Co., [80](#)  
 Valerio, C., [217](#)  
 Vallabrega, G., [302](#)  
 Vallino, Brothers, [134](#)
- Valvo, P., [272](#)  
 Van Lint, E., [234](#), [339](#)  
 Vannucci, F., [359](#)  
 Vannucci, G., [269](#)  
 Vanossi, G., [196](#)  
 Vanvitelli, Jun., [365](#)  
 Vanvitelli, Sen., [365](#)  
 Varvello, F., [134](#)  
 Varsi, G., [179](#)  
 Vecchi, C., [136](#)  
 Vegni and Son, [136](#)  
 Vela, V., [374](#)  
 Velini and Company, [196](#)  
 Vellano, S., [67](#)  
 Venditti and Torzano, [349](#)  
 Veneri, P. M., [365](#)  
 Venice, United Manufactures, [359](#)  
 Ventura, V., [142](#)  
 Veratti, C., [80](#)  
 Verciani, A., [81](#), [136](#)  
 Verga, A., [78](#)  
 Verga, N., [371](#)  
 Vérole, P., [303](#)  
 Verza, Brothers, [264](#)  
 Vetere, G., [182](#)  
 Viali and Mazzetti, [268](#)  
 Victor Emmanuel Mining Company, [21](#)  
 Vida, F., [212](#)  
 Vietri, D. A., [143](#)  
 Vieussens, G. P., [307](#)  
 Vignano, F., [308](#)  
 Viganotti, G., [272](#)  
 Vignoli, — [289](#)  
 Villa, A. and G. B., [6](#)  
 Villa, Ignazio, [308](#), [374](#)  
 Villani, R., [349](#)  
 Vincentini, Cav. P., [65](#)  
 Vincentini, P. E., [138](#)  
 Vincenzi, C., [181](#)  
 Vincenzi, E., [196](#), [201](#)  
 Vinci, M., [181](#)  
 Vineis, Baron, Brothers, [350](#)  
 Vineis, Brothers, [349](#)  
 Vineis, Cesare, and Brothers, [350](#)  
 Vineis, G. B., [349](#)  
 Vineis, M., [349](#)  
 Vineis, Testa de Morte, [350](#)  
 Viola, G., [267](#)  
 Viti, Cav. A., [80](#), [339](#)  
 Viti, Marquis A., [78](#)  
 Vittone, F., [131](#)  
 Vivarelli, C., [120](#)  
 Volpato, G., [377](#)  
 Volpine, C., [297](#)  
 Volterra, Director of the Royal Salt Works of, [75](#)  
 Vonwiller, D. and Co., [174](#), [242](#)  
 Wyse and Son, [294](#)
- W.
- WEIS (See Folletti, Weis, and Co.)  
 Werner (See Schlaepfer, Werner, and Co.)  
 Wisser, S., [274](#), [277](#), [280](#)

lv.

Z.

ZAMBELLI, G. B., 341  
 Zamera, heirs of, 264  
 Zampini, L., 344  
 Zanaidini, P., 264  
 Zanetti, G., 116  
 Zannoli, L., 267  
 Zecchini, G., 223  
 Zeppini, F., 244

Zerbini, P., 136  
 Ziccardi, N., 220  
 Ziccardi, V., 143  
 Zilliani, G. B., 252  
 Zora, G., 344  
 Zuccherelli, F., 370  
 Zuccoli, L., 370  
 Zuppi, Brothers, 270  
 Zuppinger, Silber, and Co., 264

## E R R A T A.

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In the course of printing the Italian Catalogue, the following errors have occurred in the names of persons and places:—

Page			read
14	For	Damioli Silvio, <i>Pisegno</i> ,	Damioli Silvio, <i>Pisogne</i> .
71	"	Campisi, <i>Alsio</i> ,	" Campisi, <i>Alesio</i> .
73	"	Bettani, Giuseppe, <i>Travi</i> ,	" Beltrani, Giuseppe, <i>Trani</i> .
78	"	Majorona,	" Majorana.
79	"	Gagliani,	" Galliani.
90	"	Mossione,	" Massone.
113	"	Capasio,	" Cipasso.
113	"	Galasio,	" Galasso.
142	"	Socchera,	" Scochera.
144	"	Recufero,	" Recupero.
144	"	Sant'Agostino,	" Sant'Agostino.
157	"	Albiani, Francesco,	" Albiani, Tomei, Cav. Francesco.
174	"	Vonwillor,	" Wonwiller.
179	"	Semmola, Francesco,	" Semmola, Cav. Francesco.
181	"	Anzi, Montino,	" Anzi, Don Martino.
185	"	Servente,	" Serventi.
226	"	Famoli, Giacomo,	" Jamoli, Giacomo.
227	"	Brescia ( <i>Social Manufacture</i> ).	" Brescia ( <i>Social Manufactory of Arms</i> ).
231	"	Faadi, Bruno,	" Faa' di Bruno
292	"	Rondani,	" Rondani.
271	"	Chigizzola,	" Chichizzola.
287	"	Carlatti,	" Curletti.
288	"	Sammy-Bonnet,	" Jammy-Bonnet.
289	"	Tanning and Co., <i>Modena</i> ,	" Tanning Company in <i>Modena</i> .
293	"	Panzone, Antonio,	" Ponzone, Antonio.
293	"	Sala, Francesco,	" Sala, Francesca.
301	"	Panciatichi,	" Panciatichi.
322	"	Normal Elementary School ( <i>Magistrate's Schools</i> ),	" Normal Elementary School ( <i>Preparatory School for Teachers</i> ).
343	"	Martinotte,	" Martinotti.
344	"	Descalz,	" Descalzi.
347	"	Baldantini,	" Baldantoni.
348	"	Jacuzzi,	" Jacuzzi.

An Asterisk (\*) attached to a *Number* in the Catalogue indicates that the number is to be found in the Supplement to the Official Italian Catalogue. *Objects* marked by an asterisk (\*) arrived too late to be considered by the respective Juries.

Numerals (thus, XVI.), on the *Plans* of the Exhibition, denote the *Classes* to which the objects belong.

Figures (thus, 2426), refer to the General Fine Art Catalogue.

Works of Art from Italy, scattered throughout the Building, are marked with the numbers of the General Fine Art Catalogue.

# CLASS I.

## MINERAL AND METALLURGICAL PRODUCTS.

---

### INTRODUCTORY REMARKS.

THE natural elements necessary for the successful establishment of large mining enterprises are abundantly developed in Italy. Large mineral masses have been discovered by actual mining or exploratory workings, both on the surface and by sinking to great depths. The principal metallic ores are those of iron, copper, lead, zinc, and antimony; but in addition to these, mercury, gold, cobalt, and nickel are also found. Silver is almost universally present in the lead ores.

The class of fossil fuels is represented by anthracite, but more especially by lignite, peat, and bituminous substances such as petroleum.

Sulphur is of special importance on account of its abundance and its great commercial value. Among the non-metallic minerals, limestones, all kinds of which are in considerable demand, are worked either for mortar or hydraulic cements for ordinary building stones, or in the form of marbles for sculpture or decorative purposes.

Gypsum occurs in large quantities in the three states of selenite, anhydrite, and alabaster. The alabaster of Volterra is in great demand, and maintains a special industry, namely, the production of reduced models of the most famous works of statuary and smaller decorative articles.

Quartz, in the form of sand, is employed in the sawing and polishing of marbles, and in the manufacture of glass and porcelain; it also plays an important part in the composition of ordinary building mortar. It receives a higher degree of application, when in the form of rock crystal, calcedony, jasper, &c.; it is employed in the famous Florentine mosaic work, in a similar manner to that in which it was used by Benvenuto Cellini, John of Corniola, and other artists of world-renowned celebrity.

The lavas, granites, serpentines, and other rocks of a similar character, all furnish materials of considerable economic value. The clays are also largely employed, partly in the form of ochreous colouring matters, such as the yellow earth of Sienna, and the well-known brown umber, but more generally in the form of plastic clays, some of which are very refractory, and are used in ceramic manufacture, of various degrees of fineness, from common tiles and flooring bricks, to earthenware, majolica, and porcelain.

Near Pomarance and Monte-Rotondo, in Tuscany, a great number of boiling springs occur, which rise from the ground in the form of jets of steam, containing boracic acid, sulphuretted hydrogen, and ammonia. These are made to give up their soluble contents by an ingenious series of processes, by means of which boracic acid is extracted, a product of great commercial value. The Geysers of Iceland are the only natural springs comparable to these Tuscan "Soffioni," but the latter have a more peculiar interest, as furnishing a valuable material, instead of a useless siliceous cinder.

The natural alum rocks, when artificially decomposed, furnish an excellent alum, which is known in commerce under the name of rock alum of Montioni or of Volterra.

Salt is worked in various places, being extracted from sea-water, as well as from a few brine springs.

Lastly, the various mineral waters, which together with salt will be treated in the second part, are of great importance; perhaps there is no country in Europe in which they are more abundant or varied in character. They include hot and cold springs of sulphurous, saline, chalybeate, and iodic characters, many of which have been resorted to by patients from very early times, and are said to possess great advantages in the treatment of particular diseases. Some of these waters, such as those containing magnesia and iodine, are in considerable demand both for internal trade and export.

The value of the mineral and metallurgical products of Italy, taken in the raw state, may be estimated at from 50 to 60 millions of francs, (£2,000,000 to £2,400,000 sterling), of which amount nearly one-half is furnished by the sulphur of Sicily and the Romagna.

It can scarcely however be doubted, that under the new order of things, and the liberty of association now in operation in Italy, these figures will be largely increased at no very distant period.

The government has given proofs of its desire to promote such a result, by the commencement of systematic geological and mineral surveys on a large scale, and the revision of the existing mining laws, which will doubtless be placed on a footing compatible with the interests of industry and liberty.

## SECTION I.

### MINERALS, ROCKS, AND FOSSILS OF GENERAL OR LOCAL SCIENTIFIC INTEREST. GEOLOGICAL MAPS.

This section includes a series of articles illustrative of the scientific history of the minerals and rocks of the peninsula. Although at first sight they may appear to be of trifling economic interest, it will be seen on further consideration that their attentive study is of great value, as by them we are enabled to generalise on the facts of the occurrence of the various mineral deposits, and thus to furnish valuable auxiliary materials, both in regard to their present working and future development.

**1.—112. JOINT ADMINISTRATION OF THE TUSCAN MINES AND IRON WORKS, (*Amministrazione cointeressata delle Regie Miniere e Fonderie del Ferro di Toscana*.) *Leghorn*.**

Collection of iron ore from the mines of Rio, Rio-Albano, Terra Nera, and Capo-Calamita, in the island of Elba.

The crystallised minerals in this collection include magnetic iron ore, specular iron ore, in flattened rhombohedral crystals of a lamellar form and incrusting crystals of iron pyrites; iron pyrites, in the forms of the cube, cube-octahedron, and rhombic dodecahedron; erythrine (cobalt bloom), ilvaite (jenite or lievrite), quartz, tourmaline, beryl (*acqua marina*), and garnet.

The massive specimens include the earthy, amorphous, and compact oxides, and hydrated oxides, which are worked for iron under the names of *Vena lucciola* (specular iron of lamellar or subcrystalline texture), *Vena ferrata* (compact magnetite and specular ore), *Vena marmignola* (a mixture of peroxide of iron and dolomite), and *Vena cieca* (brown iron ore), to which are added a series of ochreous clays, very rich in iron.

The pig iron and bars produced from these ores are noticed further on, at No. 40.

**2.—2075. CALI, CARLO, *Catania*.**

A collection of 221 specimens of lavas, crystallised minerals, breccias, and marbles of Etna.

Lava.

Basaltic, Trachytic, Pyroxenic, and Felspathic lavas.

Lava of the eruption of A.D. 1669.

Crystallised minerals.

Breccia.

Marble.

Alabaster.

Mr. Carlo Cali is well-known by his extensive collections of the rocks of Sicily, and more especially of the numerous and beautiful minerals of that island. A medal was awarded to him for these collections at the Italian Exhibition of 1861.

**3.—2098. COCCHI, Prof. IGINO, *Florence*.**

A geological collection, and table of sections, illustrating the structure of the eastern and western chains of the Gulf of Spezia.

This collection is the result of the surveys made for the geological map of the mountains on the east and west sides of the basin in which the gulf of Spezia lies. As the maps are not in a sufficiently advanced state to allow of publication, the sections only are exhibited.

This work, which was commenced in the year 1858, and is still unfinished, has been undertaken for the purpose of elucidating several obscure points, which have already given rise to much geological controversy, and which have an important bearing on the geological structure of Tuscany.

The two chains in question may be considered as the extreme undulations of the ellipse of the Apuan Alps, and they form part of the so-called metalliferous chain of Tuscany.

The western chain is formed chiefly of secondary (mesozoic) rocks, which are represented by the specimens Nos. 76—130, arranged according to their order of superposition, as shown along the line of Section No. 3, from the gulf to the sea.

The first rocks seen on this line are compact grey limestones, with a few shaly beds, forming the ridges bordering the gulf, which are known as the *Seni* of Santa Maria, Varignano, Pezzino, Pezzano, &c. The next formation is the compact black fossiliferous limestone of Porto Venere, the Palmaria Islands, Tino and Tinetto (No. 76 to 79), which is succeeded by the celebrated marble of *Portoro* or *Porto Venere*, and a series of very characteristic dolomites, represented by the specimens Nos. 80 to 87.

No. 88 commences the series of formations, which the author on palæontological grounds, refers to the lower lias period, and which he has further subdivided into groups, distinguished by the letters H, I, K, L, M, N, O, P, in order to refer to them more readily in the systematic study of their fossil contents.

The group I is composed chiefly of shales, with thin interstratified bands of black limestone, and contains the following fossil species:—

*Ammonites Phillipsi*, Sow., *A. articulatus*, Sow., *A. stella*, Sow., *A. cylindricus*, Sow., *A. catenatus*, Sow., *A. Meneghinii*, E. Sm. sp. ined., *A. Corregonensis*, Sow., *A. bisulcatus*, Brug., *A. pleuronotus*, Mgh and Cocchi, *A. Castagnole*, Mgh. and Cocchi.

The group K, more important than the preceding one, is formed of black limestones, which are quarried for building stones, and are sometimes shaly in structure, interstratified with shales; they contain great numbers of *Ammonites* and *Belemnites*, a few *Nautili* and *Gastropods*, and more rarely *Brachiopods* and *Lanellibranchiata*. In addition to the above species, the beds contain *Ammonites italicus*, Mgh. and Cocchi, *A. tardecrescens*.

Haner, *A. Conybeari*, Sow., *A. mimatensis* d'Orb., *A. stephanomalthus*, Mgh. and Cocchi, and many others.

The group L is composed chiefly of grey or yellowish slaty shales, containing the usual form of *ammonites*.

The group M is made up of a very friable earthy slate, of a yellowish colour, containing numerous argillaceous casts of *ammonites*, and rare bivalves. The pseudomorphic casts of *ammonites* in iron pyrites are occasionally found, and their attentive study has led to the conclusion that no oolitic species are present, the predominating forms being:—*A. bisulcatus*, Brug., *A. mimatensis*, d'Orb., *A. stella*, Sow., *A. fimbriatus*, Sow., *A. cylindricus*, Sow., &c.

The groups N and O are represented by red limestones, containing *ammonites*, and light grey limestone with chert, in which are found:—*A. bisulcatus*, Brug., *A. comptus*, Sow., *A. fimbriatus*, Sow., *A. catenatus*, Sow., *A. Conybeari*, Sow., *A. Kudernatshi*, Hauser, *A. pleuronotus*, Mgh. and Cocchi, *A. articulatus*, Sow., and many others.

The group P is the so-called *Posidonomya* slates (Nos. 120 to 124).

The species *Ammonites italicus*, which is tolerably frequent in the group K, and in the red limestone of other parts of the metalliferous chain, and which appears to be found in these slates, leads us to group them with the preceding formations. Among the slates are found some beds of a very fine texture, having the characters of the best limestones, and are quarried for that purpose. They are sometimes so very compact in structure that they may, at first sight, be confounded with an overlying red limestone, analogous to that which is below them (Verugola, San Gottardo).

The groups Q, R, S, (Nos. 125 to 130), represent the series of variegated slates, belonging probably to the oolitic strata.

These rocks dip on the side of the gulf at an angle of about 70°, beyond which there is a great gap, and the difference of the beds is represented in the various sections across the promontory (Nos. 1 to 8).

In following the mountain range to the northward, the same succession of beds is observed, but under very different conditions.

The dip of the strata gradually increases as far as Monte Parodi, where it is quite vertical; beyond this point the dip is reversed, the inclination being towards the sea-coast, that is, to the west; and on the side of the gulf the beds rise in a direction facing the Apuan Alps.

It is clear that the elevation of the chain has been accompanied by a movement of torsion, whereby one of the ends of the range has been reversed while the other has remained in its normal position.

The question to be determined is, whether

the northern or southern end has been inverted. Although it has been held by Messrs. Savi and Meneghini, in their "*Considerazioni sulla Geologia Toscana*," that the black fossiliferous limestones and dolomites of Porto Venere and the islands are of cretaceous age, the author is of opinion that this idea cannot be maintained, for the following reasons:—

1. Because the series of groups from H to S is, according to common belief, inverted, and therefore the oldest rocks are above the more recent ones. It is not possible to suppose that such a reversal could take place without affecting the overlying dolomitic and calcareous series of Castellana, Campiglia, &c., while in those places where the oolitic rocks occur in their regular positions we ought to find the cretaceous strata, which are in reality underneath. This hypothesis being admitted, the section of the San Gottardo remains inexplicable, and it is not easy to understand why the same relative position of the beds is preserved in the whole range of mountains to the north of San Gottardo, without breaks or gaps, or any phenomena of a nature to indicate such an extraordinary circumstance.

2. Because in the eastern promontory the series is in place, and the order of superposition is the same as that of the northern part of the western chain.

This small range, therefore, presents an important and instructive fact, the counterpart of which is found in a similar state of reversal between two great faults, for it is in this way that the gulf from the mountain of La Foce to its junction with the sea must be regarded.

As these liassic deposits are certainly to be referred to the lower division of that formation, the author is inclined to think that the black and grey limestones, as well as the dolomites, form part of the upper trias.

In the western chain, rocks of palæozoic age are observed, which are represented by the specimens Nos. 1 to 31, arranged in ascending order.

The older rocks are arranged in the form of an ellipsoid, which has been broken in half, the southern portion being engulfed in the sea.

The specimen No. 31, containing the impression of a *Sigillaria*, is worthy of attention.

The uppermost of the palæozoic beds consist of coarse conglomerates, which are very much disturbed, and are altogether wanting in those places where the palæozoic rocks are covered by the mesozoic limestones, the latter often containing fragments of the missing beds. It is, therefore, evident that a considerable amount of disturbance and denudation had taken place before the commencement of the mesozoic period.

The palæozoic rocks of Amelia, &c., are succeeded, in an ascending series, by lime-

stones resembling the black triassic limestone (muschelkalk), and also the saline limestone and dolomites of the metalliferous range. Nos. 38 to 51.

This series chiefly resembles that met with in the Alps of Corfino, and is covered by grey and black limestone, perfectly identical with those of the opposite promontory.

Although there are no means of establishing this identity by means of palæontological evidence, the lithological characters are so exactly similar, that the author entertains no doubt upon this point.

The relation existing between the strata is rendered more manifest by the presence of the Portoro marble, which occupies the same stratigraphical position that it does in the opposite chain, and by dolomites analogous in every particular to those of the opposite side of the gulf, which forms the summit and side of Mont Gruzza.

Next, in ascending order, comes a series of black limestones with a few shaly beds, which are largely developed at Telaro, corresponding with the series H, I, K, and L. of the opposite chain; they contain *Belemnites orthocerospis*, Savi and Mgh., *B. bisulcatus*, Brug., *Ammonites comptus*, Sow., *A. fimbriatus*, Sow., *A. stella*, Sow., *A. Phillipsi*, Sow., &c.

The next formation is a black ammonite limestone, which is largely developed in the strait of Finscarino, containing (*A. Conybeari*, Sow., *A. fimbriatus*, Sow.) and other species, Nos. 65 to 67.

Next in order are the Posidonionya slates, Nos. 61 to 70, and finally the variegated slates (varicolori), a special form of which is seen in No. 71.

The section No. 9, crossing the mountains from Amelia to Telaro, and No. 10, which goes from point Bianca to the mountains above Lerici, show in the clearest manner the nature and order of stratification of these rocks, and they appear to the author to completely establish the fact of the reversal of the strata on the opposite chain, and consequently to show that the limestones and dolomites in question do not belong to the cretaceous system.

The whole of these formations appear, to an observer looking seaward, to dip towards the land, or in a north-easterly direction.

An important series of observations has been made relating to the formation of dolomite, and the manner in which this kind of metamorphism has affected the different rocks; but this question cannot be entered into in this place, as it does not bear on the order of stratification, which is the only object of the present sketch.

The number of species of *Ammonites* collected in the groups H to P exceeds 50; they are all liassic species, belonging principally to the group *Arietes*. These, as well

as all the other fossils, will be found fully described in a descriptive monograph on these rocks, which the author and the Chevalier Meneghini have jointly prepared for publication.

1. COSCHÌ.

#### 4.—31. DODERLEIN, Prof. PIETRO, Modena.

Geological collection made in the provinces of Modena and Reggio, with a geological map and descriptive catalogue.

Mr. Doderlein is well known for his indefatigable zeal in the study of the Æmilian provinces, and more especially of their tertiary rocks and fossils. The sketch geological maps of the provinces of Modena and Reggio, with their accompanying collection, are already well-known to the world of science, and were awarded by a medal at the Italian Exhibition of 1861.

#### 5.—2079. FALLICA, ANDREA, Catania.

Crystallized celestine, from Caltanissetta.

Sulphur, crystallized, from Girgenti. Splendid specimens of the crystallizations in sulphur mines of Sicily, which obtained the medal in the Italian Exhibition of 1861.

#### 6.—40. FOICO, GAETANO, Chiavenna.

Collection of minerals from the neighbourhood of Chiavenna.

#### 7.—2076. GAMBA, P., Pietrasanta.

Collection of crystallized minerals from Versilia.

#### 8.—1784. GENNARI, Prof. PATRIZIO, Cagliari.

Minerals and objects of natural history of Sardinia.

M. Gennari is indefatigable in his studies of the mineral formation of the island; and the articles he exhibits have for their object to afford some knowledge thereof.

**9.—61. LIPARI (LOCAL EXHIBITORS' COMMITTEE) (*Messina*).**

A collection of minerals.

**10.—138. LUCCA (SUB-COMMITTEE OF).**

Collection of minerals of the province of Lucca.

**11.—77. NAPLES MINERALOGICAL MUSEUM, by director Prof. Scacchi.**

A collection of minerals from the southern provinces of Italy, and a series of artificial crystals.

**12.—2084.\* REGGIO (CALABRIA) (SUB-COMMITTEE FOR THE EXHIBITION).**

Magnetic iron ore from Aspromonte.

Antimony and nickel ores from Cavolo.

Argentiferous galena from Grottaria. Manganese ores from S. Giorgio, Politeno.

Amianthus from Cittanova.

Marble from Cavolo.

**13.—2082\*. THE MAYOR OF RECALMUTO, (*Girgenti*).**

Rock salt in transparent and violet blue varieties, from the saltworks of Recalmuto, in the province of Girgenti.

**14.—115. VILLA, A. & J. B., *Milan***

Collection of fossils from the cretaceous rocks of Brianza.

This collection illustrates the nature and characters of the different stages of the cretaceous rocks occurring in the hills of Brianza.

## SECTION II.

### METALLIC MINERALS—METALLURGICAL PROCESSES—MINES AND MINING MAPS.

#### *A.—General Scientific and Industrial Collections.*

**15.—2097\*. SCHOOL OF APPLIED ENGINEERING, (*Scuola di applicazione degli Ingegneri*), *Turin*.**

Galena from the mine of Monteponi (Iglesias).

Copper pyrites from the mine of S. Marcel (Aosta).

Copper pyrites from the mine of Ollomond (Aosta).

Nickeliferous iron pyrites from Locarno (Varallo).

Speiss obtained in the treatment of the above, from the smelting works of Della Rocca (Varallo).

Lignite from Cadibona mine (Savona).

Plans of the workings of Cadibona mine.

Models of do. do. (60 pieces, £4).

A collection of 200 Models of crystals (price £16).

**16.—56. HAUPT, TEODORO, *Florence*.**

Plans and synoptical tables illustrating the mines of Tuscany.

The working of mines in Tuscany dates from the earliest antiquity, having exercised an important influence on the history and social economy of the ancient Etruscan people. Evidence of long continued working

ore furnished in certain districts, where modern researches have encountered the remains of workings in close superposition, which are assignable to the Etruscan, Roman, and Medieval epochs, as well as to the centuries immediately preceding the present time.

Mr. Haupt's principal object in exhibiting, is to furnish a complete representation of the mineral deposits and mining history of Tuscany, which is contained in an atlas of seven maps, distinguished by the numbers 1, 2, 4, 6, 7, 8, and 10.

These maps are the result of the continuous labours and observations of a period of 25 years, and they are accompanied by a synoptical table published during the last year, in which the policy of carrying out exploratory workings in districts which are now neglected, is strikingly set forth, as we see that these districts are those in which the majority of Tuscan mines were worked in former ages.

The plan No. 4, on the scale of 1-40,000th, or about  $1\frac{1}{2}$  inches to the mile, includes the district of the boracic acid and sulphur fumaroles, locally known as *fumacchi*, or *soffioni*, and a large extent of mineral ground.

Map No. 10, also on the scale of 1-40,000th, contains the various districts in which mineral fuel is found.

Nos. 2, 6, 7, and 8, are special plans, drawn on the scale of 1-20,000th, or about 3 inches to one mile, having the thickness of the deposits indicated by a slight distortion, on a larger scale. The whole of the mineral veins, together with the fumaroles, brine springs, and lines of volcanic activity (Pietramala), which have a remarkable amount of parallelism one to another, form two great groups, the intersections of which are the chief seats of mining enterprise. This double parallelism has also been observed to exist in the mining centres lying between the Apuan Alps and Mount Amiata, where the direction of the deposits is the same as that which is seen in the other districts. These courses are indicated by gold and silver lines on the plan No. 1.

The average direction, deduced from the mean of a series of sixteen observations, is N. 3° W., the extremes lying between the directions N. 28° W. and N. 11° E., or a total variation of 39°.

The mean direction of the second group is N. 54° W., as deduced from 12 observations whose directions vary between N. 67° W., and N. 45° W., or 22°.

The direction of the brine springs, deduced from the mean of a series of five lines drawn through the salt district, is N. 46° W., the variation from this direction being 7° on either side.

Another series of five lines, taken in the same district, gives a direction of N. 6° E.,

with an extreme variation of 10° 30' on either side.

The course of the deposits of alum worked at Montione and Frassine, is similar to that of the last mentioned salt group, being N. 50° E.

The fumaroles, whose vapours contain boracic acid, are arranged in four series, having a mean direction of N. 47° W., with a variation on either side of 5½°.

Two other lines of fumaroles have a direction of N. 12° E., which coincides with the strike of the four great deposits of iron ores existing in the island of Elba.

The lines of strike passing the marble quarries near Seravezza give the directions N. and N. 53° W. The direction of a line passing the mines of Montieri, Gerfalco, and Poggio Mutti, N. 48° W., or parallel to the line of the subterranean fires of Mount Oggioli, Pietramala, and Peglio.

The directions of the three gigantic metalliferous lines of the district of Massa, are N. 13° W., N. 11° W., and N. 3° W. while that of the deposit of alum at Aversa, Monterotondo, and Sasso, is N. 2° W.

All the above lines of bearing are included between the directions N. 28° W. and N. 12° E. in the one case, and between N. 67° W. and N. 46° W. in the second instance, that is, between the extremes of irregularity, of 4° and 21° respectively, an amount of variation which is sufficiently small to allow of their being referred to two principal groups in the manner proposed in the foregoing paragraphs.

From these observations, Mr. Haupt has concluded that in Tuscany the various metalliferous deposits, as well as those of alum and sulphur, the brine springs and the various volcanic emanations, are all to be considered as the different phases of one great formation, which is due to causes still in active operation, in the production of borax, petroleum, sulphur, &c. The formation is, however, referable to two different periods of unequal value as far as minerals are concerned, for many of the veins contain no metalliferous substances, and it is only in a few of the metalliferous deposits of the Maremma formation that silver ores are found.

The above conclusion, which is the starting point of several others, and is founded on the law of the prevailing direction of the Tuscan mineral veins, is verified by several coinciding circumstances, which are shown in the maps Nos. 1 and 4, and are also briefly noticed in the succeeding paragraphs. The two lines which unite the extreme points in the salt districts, and include the four principal series of boracic acid *soffioni*, are parallel to one of the leading lines of direction of the minerals veins.

The line passing through the fumaroles of Lucignano and Serrazzano, combines exactly with that uniting the saline springs of Fonte-

bagni, Lorianò, and Scornellina, while, in like manner, the line joining the fumaroles of Monterotondo and Sasso coincides with the direction of the line of salt springs rising between Fattagliano and Prugnano.

This relation, in direction between the north western *soffioni* and salt springs, is reproduced in a surprising manner between the most important borax districts and the metalliferous country of Tuscany, leading us to suppose that they may be regarded as in some sort a continuation of the latter.

In addition to these local coincidences, we must add the fact of the occurrence of borax and alum in the same place (at Sasso and Monterotondo), and likewise the association of deposits of alum with metalliferous ores near Accesa, both of which are in the direction N. 12° W. In the same manner, the fumaroles of the lake of Monterotondo correspond on the line of N. 49° W. with the mines of Cugnano, and, in the direction N. 3° E., with the copper veins of Serrazzano.

Another circumstance also appears to be peculiarly significant, namely, that in the whole of Tuscany the most productive mineral region is that of the borax lagoons. On the north western portion of this area, copper ores are found occurring in veins of serpentine rocks. Further towards the south, mines of copper and argentiferous lead are worked, principally in the macigno formation, which is also the head-quarters of borax production.

The conclusions drawn by Mr. Haupt are, therefore, based on evidence furnished by the direction of the lodes, as deduced from observations extending over an extent of about 8,000 square miles, on the local coincidence of three different substances, alum, borax, and sulphur, on the combination of three borax districts with three metalliferous zones, and, finally, on the evident concentration of metallic ores in the borax countries.

These four arguments are, however, reducible to two, the first of which arises from the local combinations, and the other from the law of the parallelism of the mineral veins; the combination of both of these lines of reasoning appear fully to justify the conclusions at which we have already arrived.

By thus tracing a series of lines through all the points at which minerals are known to occur, Mr. Haupt claims to have established the limits and sub-divisions of each district. It will be seen that considerable gaps occur in some places, which, from their great extent, seem to indicate that many mineral masses must be still unknown, as, for example, in the mountains of Lucca and Pisa. For the exploration of these unknown districts our present knowledge of the other mineral zones would be of considerable value, as it might reasonably be supposed that new deposits would be found in the prolongation of the known axes, or in their immediate vicinity.

In like manner, attentive resources carried on on this principle, aided by the evidence of history, would probably lead to the re-discovery of the old Etruscan mines, many of which are supposed to be still unknown to us.

## 17.—68. MARCHESE, EUGENIO, Royal Corps of Mining Engineers, *Cagliari (Sardinia).*

Collection of the economic minerals of the island of Sardinia, classified according to their occurrence, with a descriptive catalogue, and a short notice of the mineral wealth of the island.

The island of Sardinia is composed principally of rocks of Silurian age, consisting of slates, which are often considerably altered, and an upper limestone series. These rocks contain large quantities of lead, iron, copper, manganese, and antimony ores; in addition to which anthracite and an important deposit of lignite are known to exist. The lead ores, however, are the only ones which have, as yet, been worked on the large scale; they are found in the district of Iglesias, in the south-western part of the island, and in those of Nuoro, Lanusei, Cagliari, and Sassari.

### SPECIMENS OF THE ROCKS IN WHICH THE MINERAL VEINS ARE FOUND.

- Mica slate (Argentaria).
- Grey talcose slate (Montevecchio).
- Red and yellow ferruginous clay slate (do.).
- Slate altered at its contact with the granite (San Gregorio).
- Slate altered at its contact with the granite (San Gregorio).
- Ferruginous quartz rock (Perda Sterri).
- Ferruginous slate, altered by infiltration from an iron stone vein (San Gregorio).
- Slate of a less ferruginous character (do.).
- Finely laminated clay slate (Phyllade) (Monteponi).
- Slate passing into quartz rock (S. Arcelloni).
- Fossiliferous clay slate, containing impressions of *Orthides* (Flumini-Maggiore).
- The same, containing casts of *Murchisonia* (do.).
- Black limestone, with *orthoceratites* interstratified with the above slates (do.).
- Slate passing into a crystalline state (do.).
- Dendritic limestone, some very ferruginous (Monteponi).
- Limestone, with white veins and argillaceous slaty matter (do.).
- Soft dendritic clay slate, resting on the preceding limestone (do.).
- Yellowish limestone, containing white sparry concretions (do.).

- Pale blue and white limestones (do.).
- Blue limestone, veined with white (Brabusì).
- Serpentinous limestone (ophicalce) (Domus de Maria).
- White saccharoidal limestone (do.).
- Limestone, forming the transition between the preceding rocks (do.).
- Ferruginous limestone (Monte Santo di Lula).
- Black limestone, partly crystalline (do.).

#### MINERAL VEINS.

##### LEAD.

The lead veins occur in lines of fracture traversing the Silurian rocks, and the superimposed limestone. The same ores are also found in contact veins, intermediate between the slates and limestones, in beds or flats, in the limestone, and in irregular masses interspersed through these rocks. The gangue mass, or filling of the regular veins, consists chiefly of quartz, fluorspar, and sulphate of baryta.

##### QUARTZOSE LODES.

The principal lodes of this class are those of Montevecchio, which are worked in the concessions of Ingurtosu and Gennamari, Nos. 49 and 50. A few smaller veins are of secondary importance, only one of them having been worked to advantage at Perdixeddou, near the mine of Montevecchio. The lodes of Sarriabus (Gibbas, Peddi-Attu, Perd'Arba, Monti-Narba), in the district of Cagliari, which were formerly worked, have since been re-examined, but without any favourable result, as they have again been abandoned. The veins at Lula, in the district of Nuoro, have been tried in exploratory workings at Gusurra, Su Suergiolu, Sos Enattos, Interattas, Fontana vermicosa, and Torpé, but they are all abandoned, owing either to the presence of an undue proportion of blende in the ore, or from unfavourable local conditions.

Veinstone, taken between the walls, containing quartz, galena and carbonate of iron (Montevecchio).

Galena, with copper pyrites, traces of blende and quartz (ditto).

Compact Galena in large masses, with traces of quartz (ditto).

Compact Galena, with veins of copper pyrites and quartz (ditto).

Galena, with quartz, blende, copper pyrites, and traces of sparry iron ore (ditto).

Large crystals of Galena, with the walls of the vein attached (Gennamari).

Galena, containing veins of quartz partially crystallised, and fragments of quartz-rock (do.).

Galena, with copper pyrites and quartz (do.).

Galena, with hemitropic crystals of anglesite (ditto).

Galena, with quartz (Gennamari).  
Compact Galena, a commercial sample (Ingurtosu).

Compact Galena, with veins of quartz, and sparry iron ore (Sos Enattos).

Galena, copper pyrites, blende, iron spar, and quartz (ditto).

Blende, with a little galena, quartz, and pyrites (ditto).

Fragment of a veinstone, containing Fluor spar, Galena with quartz (St. Arrideli).

##### FLUOR SPAR LODES.

Among the veins containing fluor spar are those of Argentaria (Nuoro) and Correboi (Lanusei). The ores are usually freer from pyritic impurities than they are in the quartz ore veins, but the yield of lead usually diminishes with the increase of depth in the workings. The first of the above-mentioned veins has been worked at several points, along a distance of about three-quarters of a mile, with good results, as the ore is regular in occurrence, and requires very little dressing. The roads for conveying the ore to the shipping place have been improved, but the unhealthy nature of the locality renders it impossible to carry on the workings during the summer months.

Wall of quartzose vein with copper pyrites, traces of galena, and sparry iron ore, from an old working (Gusurra).

Blende, galena, and quartz (do.).

Fibrous galena with blende (do.).

Blende, with veins of quartz and traces of galena (Su Suergiolu).

Fine grained galena (Baccu-Locci).

Veinstone with pale blue fluor spar, galena, traces of pyrites and blende (Argentaria).

Compact galena, traces of fluor spar (do.).

Compact galena of steel grained texture (do.).

Galena with fluor spar and acicular crystals of white lead ore (cerussite).

Galena with fluor spar and crystals of anglesite (Sulphate of lead) (do.).

Galena with anglesite and pyrites (do.).

Galena with anglesite, pyrites, and fluor spar (do.).

Galena with fluor spar and hemitropic crystals of anglesite (do.).

Galena with fluor spar and pyrites (do.).

##### VEINS CONTAINING HEAVY SPAR OR SULPHATE OF BARYTA.

The lodes containing heavy spar bear a very small quantity of silver, interspersed through the gangue, in kernels or small masses, but never in the form of veins or strings. To this category belong the vein of Palmari, near Iglesias, and that of Zurufusu, near Cape de la Frasca, and S'Arcelloni, near Burcei, as well as others situated in the

neighbourhood of Iglesias, and of Flumini Maggiore.

The vein of Rosas, in the district of Iglesias, may also be included in this place. The ore produced is a mixture of blende and galena, only containing 35 per cent. of lead. The difficulty of treating such an ore has caused the abandonment of this mine.

Galena (S. Arcilloni).

Galena in large crystals, with heavy spar (Zurufusu).

Sulphate of baryta, with kernels of galena (Zurufusu).

Veinstone of heavy spar galena and blende (Zurufusu).

Blende and galena, closely intermixed (Rosas).

#### CONTACT VEINS.

The contact veins, occurring in the lower part of the Silurian limestones, are only found in a portion of the district of Iglesias. They produce a galena accompanied by more or less ferruginous clays, forming an ore which is very fusible and in great demand. The galena of Reigraxius (No. 53), is distributed in beds, called by the miners columns, among the interposed clays. The ore of the S. George mine is more particularly distributed in the limestone, in a bed, parallel to the plane of contact with the older slaty rocks, the ores, which require a very simple dressing process, giving a yield of from 70 to 75 per cent. of lead, but the irregular character of the deposits render the workings very expensive. The mine of Reigraxius has not been sufficiently examined to allow of any definite conclusions being formed as to the exact distribution of the minerals.

Compact bright dendritic clay, from the contact of the limestone and slate (Reigraxius).

Argillaceous shale, with galena (do.).

Galena with white limestone (do.).

Compact galena of lamellar structure (do.).

Vein of fine grained galena, included between the shaly clays at the contact of the slates and limestones (do.).

Reniform mass of galena, coated with clay (do.).

Galena with traces of blende and pyrites on limestone (do.).

#### REDS OR FLATS.

The flats of ore intercalated in the limestones, are specially represented in the mine of Monteponi (No. 48). The ore is found in a mass of clay included between two beds of limestone, which is very variable in direction and thickness. It often contains a small quantity of pyrites, in addition to which large and beautiful specimens of cerusite and anglesite, well known to mineral collectors, and important deposits of white lead ore are obtained. The galena contains but little

silver, and is obtained in two qualities, containing from 70 to 81 per cent. and from 58 to 70 per cent. of lead, both of which are easily reducible. A large quantity of ore is also raised containing only 25 per cent., which will be worked as soon as the requisite dressing machinery is erected.

The deposit of San Georgio (No. 51) is analogous to that of Monteponi, and is now being explored.

The results of the workings up to the present time have failed to discover an equally rich deposit.

Yellow ochre (Monteponi).

Ferruginous limestone with infiltrations of galena (do.).

White calc spar with fine grains of galena (do.).

Galena with ochre, cerusite, pyrites, and calcite (do.).

Galena with anglesite and cerusite (do.).

Galena with anglesite, pyrites, and native sulphur (do.).

Various specimens of galena and anglesite (do.).

Massive carbonate of lead, tarnished (do.).

Massive carbonate of lead, white (do.).

Specimens of anglesite (do.).

Galena with anglesite and native sulphur (do.).

Carbonate and sulphate of lead, coating galena (do.).

Galena with minium (red lead) (do.).

Commercial galena, medium grain (do.).

Fine grained galena, with blende (do.).

Fine steel-grained galena, with cerusite (do.).

Calc spar, with galena (do.).

Decomposing limestone, with minium (do.).

White limestone with carbonate of lead (do.).

Tabular masses of heavy spar (do.).

Compact galena of lamellar structure, (San Georgio).

#### IRREGULAR DEPOSITS.

These deposits have been extensively examined, principally at Masua, Monti-Cani, Monti-Anixeddu, and Porto-Corallo. Several large masses of minerals have been discovered imbedded in clays or limestones, but they are extremely irregular, and there is no clue for the discovery of further deposits when those now being worked are exhausted.

Galena, with argillaceous coating, peculiar to the deposit.

Galena, with pyrites (Masua).

Galena, with carbonate of lead (do.).

Rich ore, containing carbonate and sulphate of lead in clay (do.).

Galena, with clay and limestone (Monti Cani).

Compact large-grained galena (Il Cortei).

Galena, with limestone and clay (Pubusiu).

Galena, altered at the surface by exposure to the air, from an old working (do.).

Galena, with large crystalline facets in ferruginous limestone (Buon Cammino).

Compact fine-grained galena, with clay (San-Benedetto).

#### SLAGS FROM OLD SMELTING WORKS.

The slags of old smelting works form a notable item of the mineral products of the island of Sardinia; they are the remains of smelting operations carried on both in the middle ages and in the time of the Romans, apparently for the purpose of extracting silver from its ores; and their composition is such as to lead us to suppose that the old miners were in the habit of working deposits of rich silver ores, which have not yet been rediscovered, as well as the minerals which have already been described. The shafts of the "old men's" workings are very numerous in the district of Iglesias, where they are sunk exclusively in the Silurian limestones.

Large quantities of slags are found near the villages of Domus-Novas, Villa Massargia, Masei, near Flumini Maggiore, on the banks of the torrent of that name, and in smaller quantities at Grugne, Arenas, and Mateppe. The value of these heaps is very uncertain. Those of Domus-Novas was estimated, in 1859, as containing 110,000 tons, and those in the neighbourhood of Flumini Maggiori were supposed to amount to from 20 to 25,000 tons.

The slags of Villacidro, amounting to about 15 or 20,000 tons, differ from the preceding, in that they are the result of the metallurgical treatment of the Montececchio ores in the more recent times.

Specimens of ordinary lead slags from Canonica, Villa Massargia, Domus-Novas, Barisonis.

Specimens of very rich lead slags from Grugne, Flumini, Villacidro.

Earthy flux from (do.).

Limestone, with sandy rock (Lula).

#### IRON.

First, in importance among the Sardinian ores, is magnetite, which is found in considerable masses in the older rocks, and some of the earlier granites, which are sometimes associated with iron garnets. The principal localities are at Perda-Sterri (Cagliari), Perda-Niedda (Iglesias), and Capoterra (Cagliari). The two latter mines are the only ones favourably situated for working, both on account of the abundance of the ore and its proximity to the sea.

Hematite (specular iron) and brown iron ore are found in the deposits of Seneghe (Oristano) and Enna-Mosta (Iglesias). These deposits are comparatively unknown, not having been properly examined.

Specular ore (Seneghe).

Magnetite (Circuris).

" (Perda Sterri).

Garnet rock (do.).

Magnetite (Sant' Antonio).

" (Bari).

#### COPPER.

The copper lodes of the district of Lanusei, near Ferlenia, and of Barisonis (Iglesias), have both been examined; in the latter large masses of copper pyrites, accompanied by blende and galena, have been discovered; but the workings are still on too small a scale to allow of any large or profitable production.

Pure copper pyrites (Tertenia).

Copper pyrites, with iron pyrites (Barisonis).

Commercial sample of copper ore (do.).

Iron pyrites from veins (do.).

Pure copper pyrites, with included masses of galena (do.).

Copper pyrites, interspersed through clay, with galena (do.).

Copper pyrites and galena (Chirra).

Copper pyrites and crystallized quartz, in talcose slate (Talana).

Common cupiferous slags from old workings (Rosas).

#### MANGANESE.

Manganese ores are found in the trachytic rocks, at Caporosso on the west coast, and at Sas Covas, near Bosa. The mine of the Sas Covas has yielded a quantity of very good ore, but the deposits are extremely irregular; while in the former mine the ores were so poor that the workings could not be continued.

Another deposit, which occurs near Padria (Alghero), appears under more favourable circumstances.

Small vein of peroxide of manganese, with a trachytic crust (Sas Covas).

A similar specimen, partly crystalline (do.).

Peroxide of manganese, of closely fibrous texture (do.).

A similar finely fibrous specimen (Padria).

#### ANTIMONY.

The ores of antimony are found in considerable quantities in the districts of Lanusei, near Villasalto. The mode of occurrence is both in irregular veins, which are intercalated in the Silurian slates, and in irregular masses or nodules, which are of considerable size, but unfortunately of very capricious distribution. This latter circumstance, combined with the local difficulties, has led to the abandonment of the mine, with no present prospect of its being re-opened.

Black antimonial slate (Suergiu).

Compact sulphuret of antimony, in black slate (do.).

Compact antimony ore.

## MINERAL FUEL.

Anthracite is found in the carboniferous rocks, near the centre of the island, in the neighbourhood of the villages of Seni and Perdas de Fogu, but it is not in workable quantity at either place.

The lignites of Sardinia are found in two principal districts, in the lower tertiary rocks, to the south-west and south-east of Iglesias, one of which is in the vicinity of Gonnesa, while the other is near Villa Massargia. A series of trial workings in the basin of Gonnesa, at Terras de Collu, Bacu-Abis, Funtananiare, and Terra-Segada, have resulted in the discovery of beds of fossil fuel, from 19 to 22 inches thick, containing at Bacu-Abis from 6 to 12 per cent of ash, which is only slightly pyritic.

Schistose anthracite (Seni)

Common anthracite (do.).

Tertiary limestone, with lignites (Terras de Collu).

Lignite, with decomposing pyrites (do.).

Bed of lignite of fine quality (do.).

Lignite (Bacu-Abis).

Lignite, somewhat schistose (Bacu-Abis).  
Lignite (Meana).

## SALT WORKS.

The salt works for the evaporation of sea-water contribute another item to the mineral produce of the island. These works are a monopoly of the Crown, and the company by which they are farmed has introduced considerable improvements into the workings which have been concentrated in the neighbourhood of Cagliari and Carloforte, by abandoning several of the old salt pans.

Samples of bay salt from Cagliari.

Such, then, are some of the better-known elements of the mineral wealth of Sardinia. Numerous obstacles stand in the way of preventing their being developed on a large scale, among which are the unhealthy nature of the climate, which compels the suspension of work during many months of the year, the inaccessibility of the different localities, and the absence of roads for the conveyance of ores from the mines to the shipping, and, finally, the want of a sufficiently numerous population capable of furnishing underground labour.

## B.—Collections of Special Mining and Metallurgical Products.

## § 1.—IRON.

The deposits of iron ores in Italy, in addition to the classic reputation of those in the island of Elba, *insula inhezausta metallis*, are of great extent. They are found in the mountain regions of Piedmont and Lombardy, in many parts of Tuscany, in the Roman states, the Neapolitan provinces, and in Sardinia, and in the smaller islands of the Mediterranean, usually in large quantities and of an excellent character.

The workings of these deposits are usually dependent on the nature of the locality; they are most active in those parts where communication with the sea allows of the export of the ore, or where the internal communications allow of their being carried to smelting works in the immediate vicinity.

In the absence of large deposits of mineral fuel in Italy, the production of iron is necessarily limited, by reason of the small quantity of charcoal available for smelting purposes. This will account for the fact that, in spite of the abundant supply of good ores, and water power available for driving machinery, the production of Italian pig iron does not amount to more than 38,000 tons annually. Of this quantity, from 3,000 to 4,000 tons are exported, about as much more is converted into castings in a first or second fusion, and from the remainder about 25,000 tons of bar iron and 500 tons of steel are produced.

About 48,000 tons of ore annually exported from Elba, the greater part being hematite (specular iron), containing from 55 to 68 per cent. of iron. About half of this quantity is sold to foreign countries, at a price of 11s. per ton; 3,000 to 4,000 tons are worked up in a few Catalan forges, which are still in operation along the mountainous coasts of Liguria and Naples; 29,000 tons are smelted in six blast furnaces, erected at Follonica, Cecina, Valpiana, and Pescia, in Tuscany, producing about 12,000 tons of pig iron of excellent quality, which is in great demand for exportation at the price of 84s. per ton, delivered at Leghorn; such portions of the above quantity as are converted by further treatment into bar iron and castings are also readily taken at Leghorn, at the price of £10 per ton for castings, and from £11 4s. to £15 4s. per ton for bars.

Sixteen blast furnaces are scattered along the valleys of Como, Sondrio, Bergamo, and Brescia, producing about 13,000 tons annually, from the treatment of sparry iron ores, containing manganese; these ores, which are often altered superficially by the action of the atmosphere, are of an excellent quality and easily reducible, containing on an average about

43 per cent. of iron. The above quantity of pig iron produces about 10,000 tons of bars, which are in great demand, on account of their steely character, at the price of £16 to £18 per ton.

The magnetic ores of Traversella and Coigne supply the blast furnace and forges of the valley of Aosta, producing an excellent quality of iron, which, in spite of its high price, £18 to £19 4s. per ton, is sought after, especially for work which requires to be forged cold.

Lastly, the furnaces of Mongiana, in Calabria, and those of Terni, near Rome, are worked with hydrated peroxides (brown iron ores).

The conversion of the pig iron is effected principally in puddling furnaces, heated either by the waste gases from the blast furnace or by the gas produced from the combustion of peat in special generators. The welding and re-heating are performed by means of small open fires. A smaller quantity of iron is produced in the small blast hearths known as the Comtois and Bergamasc forges. In a few instances rolling mills have taken the place of the old-fashioned small hammers in the forges, and the direct-acting steam hammer is also being introduced.

The steel is principally produced in the open fire by the German forge process; in the works at Castro, steel has been produced during the past year, by means of the puddling furnace, heated by the gases from peat and wood.

To sum up the foregoing we have the following figures, representing the iron production of the peninsula:—

Ores exported ... ..	22,000 tons.
Pig iron exported ... ..	3,500 „
Castings in 1st and 2nd fusion ... ..	3,500 „
Bar iron ... ..	25,000 „
Steel ... ..	500 „

In addition to the 25,000 tons of iron produced from Italian ores, about 5,000 tons are manufactured from old iron and English pig, in a number of small forges, consisting usually of one Comtois or Bergamasc fire and two hammers.

In some parts of Italy, before the formation of the present government, the production of iron was stimulated by heavy import duties on the foreign article; these, however, have been considerably reduced by the new tariff, by which the Italian ironmaster has to compete more equally with the producer in other countries.

There is very little doubt that, in spite of the improvements introduced in the manufacture, the present circumstances of production are sufficiently unfavourable to call for a differential duty in aid of the native producer; but it is hoped that the retention of the present duty of £2 per ton on foreign iron, for a few years to come, will give time for the development of the manufacture; and if the local burdens and obstructions be removed, there is a fair chance of success, even under a system of free trade.

It is evident that, in certain localities, as in Lombardy and the valley of Aosta, the production will always be in proportion to the supply of charcoal or peat obtainable.

In Tuscany, however, where good iron is now produced at a price of £11 4s. per ton delivered at Leghorn, there appears to be no doubt that the production may be greatly increased.

Mr. Ponsard, an eminent engineer, who has devoted much time to the investigation of the causes likely to improve the production of iron, is of opinion that in one particular branch, namely, the export of iron ore from Elba, a greatly increased business might be done with foreign countries if the price could be reduced; he has therefore proposed that the price be diminished to one-half of the present rate. Should this suggestion be carried out, there is no doubt that the export will be largely increased.

The particular characters of the ores and fuel employed in the different localities, will be described in the succeeding pages.

## LOMBARDY.

The carbonates of iron, containing manganese, which are partially decomposed by atmospheric agencies, are found in Lombardy, in beds in the clay slates of the triassic (upper new red) period.

Five of these beds are known; they are separated from each other by slaty partings, the total thickness being from 20 to 27 feet, the thickest bed varying from 5 to 10 feet. The triassic rocks occur in Lombardy, continuously between the river Caffaro and the lake of Como, but the points at which the minerals occur, and where workings have been carried on from time immemorial, enclose a space of about 30 kilometres (11½ square miles). At La Manina, in the valley of Dezzo, the pure massive ore exceeds 27 feet in thickness.

Ochreous iron ores are found at Monte-Penedoletto, near Bormio, in the Valtellina.

These ores are only worked in quantities sufficient to supply the blast furnaces scattered

along the valleys of the provinces of Como, Sondrio, Bergamo, and Brescia, the total yield of which, amounting to 13,000 tons, can only be increased by the introduction of processes which can be worked with a considerably less consumption of fuel.

The quantity of charcoal expended in the production of 100 tons of pig iron amounts to 100 tons, in which is included the loss and waste in conveyance.

The pig iron obtained from these ores is converted into bar iron and steel, with the exception of a small quantity which is made into castings. The bar iron is produced either in puddling furnaces, heated by gas obtained from charcoal, peat, or lignite, or by the Bergamasc and other old-fashioned forge processes, of traditional antiquity in Camonica and Seriana.

Samples of the different products will be found exhibited.

The Italian steel is almost entirely produced from these Lombard charcoal irons. Two processes are employed in its production, the first one being the original forge, or natural steel process, which is worked in the old-fashioned way or with slight modifications. In the first case the daily yield of each fire is 180lb., which is obtained by an expenditure of 900lb. of charcoal, equal to five times the weight of the steel produced in the modified process, which consists in employing two fires working alternately; the production amounts to 450lb. per day, the consumption of fuel being 2,160lb. or in the proportion to  $4\frac{1}{2}$  to 1. The steel thus obtained is of good quality and much in demand, although it contains small quantities of inter-spersed oxide which destroy its homogeneity. It was formerly exported to England, to be converted by melting into cast steel.

The second process, which has been recently introduced by Mr. Andrea Gregorini, of Lovere, consists of treating pig iron free from sulphur, and containing but little manganese, in a reverberatory furnace, heated by the gases obtained from peat and wood in a special generator. This plan has been found to give a product of a superior quality to that obtained in the older and imperfect forge process.

The total amount of steel in Lombardy amounts to about 750 tons annually; this quantity could be largely increased if the gas puddling furnace were more generally employed.

J. CURIONI.

### 18.—26.—CORNELIANI, LUIGI, *Milan.*

Specimens of cast and wrought iron from the works of Premadi, near Bormio.

Ochreous iron ores from the mines of Mont Penedoletto, and Mont Zobri.

Grey foundry pigs and mottled forge pigs.

Blooms of iron obtained in the so-called Bergamasc forge.

Blooms, bars, and finished iron produced in a gas puddling furnace, worked with turf and charcoal, the re-heating fire is a low charcoal blast hearth.

### 19.—29. CURIONI, GIULIO, *Milan.*

Decomposed sandstone, used as moulding sand by iron-founders.

Good moulding sand was not known to exist in Lombardy when the exhibitor called attention to the fact that an argillaceous sandstone, produced by the decomposition of the cretaceous rocks near Gorlago, was eminently suitable for the purpose. This opinion having been established by experiments, further researches were made, which have resulted in

the opening of a large quarry at Mont-Canto, near Adda, from which all the Lombard foundries are now supplied.

Mr. G. Ragazzoni has discovered a material capable of being used for the production of the most complicated castings in the sandy clays of the Jurassic or oolitic beds of Carcina.

### 20.—30. DAMIOLI, SILVIO, *Pisogno (Brescia).*

Four specimens of iron ore, with the rocks in which it is found.

Four samples of pig iron.

The specimens illustrating the stages of the manufacture of bar iron.

Bar iron obtained from pigs produced at Pisogno furnace.

Mr. Damioli exhibits a series of specimens obtained from his own works at Pisogno, on the lake of Iseo, among which are:—

The triassic sandstone, underlying the shales in which the beds of iron spar are found.

The argillaceous shale.

Iron spar from the lower bed.

The same ore from the middle bed.

A sample from the top bed.

Fine grained pig iron.

Spongy pig iron.

Ball or bloom from the first refining process.

Bloom from the second forging.

Bars drawn out under the hammer.

Merchant iron.

Blast furnace slags.

The specimens Nos. 1 and 2 may be taken as types of the works in which the whole of the Lombard iron ores are found.

## 21.—49. GLISENTI AND RAGAZZONI, *Brescia*.

Ores, rough pigs, castings, bar iron and steel, from the Val Trompia and Val Sabbia, Brescia.

These exhibitors have greatly improved the quality of the cast iron produced in the valley of Trompia. In order to obtain good foundry iron, they have re-opened several old workings in which iron spar, nearly free from manganese, is found in veins traversing mica slate. This ore is of great value for mixing with that obtained from the stratified deposits which usually contain an excess of manganese.

## 22.—51. GRASSI, BROTHERS, *Schilpario (Bergamo)*.

Iron ores and cast iron from Scalve.

This collection contains the ores and fluxes employed in the furnaces of the valley of Dezzo, more especially at Schilpario, including carbonate of iron, with manganese, from the mines of Castelnuovo, Cima-Collo, Carregiata, Desiderata, and Gaffiona, Nos. 1 to 5, and two qualities of limestone which are added to the ore in the proportion of 5 per cent. for the purpose of fluxing. No. 6 is a carbonate of iron from Manina, with a very small quantity of manganese; No. 7, Samples of the furnace slags.

These minerals occur in the same rocks, and in a similar manner to those of the valley of Rizzolo at Pisogno, in Brescia, described in No. 20.

## 23.—52. GREGORINI, ANDREA, *Lovere (Bergamo)*.

A collection of ores, pig iron, wrought iron blooms and steel, illustrating the different processes of steel manufacture.

Mr. A. Gregorini, of Lovere, is the principal manufacturer of steel in Lombardy. 1. A variety of natural steel, or forge process,

peculiar to the valley of Camonica, and the puddling furnace heated by the gases from a mixture of peat and wood, are the methods employed in these works. In addition to steel making, bar iron and an intermediate steely product, which is employed for agricultural implements, are produced at the Lovere works, in small open fires.

The following is a classified list of this Exhibitor's collection:—

### *Raw Materials.*

Sparry iron ore from the mines of Val Glegna.

Unaltered carbonate of iron and manganese from Lovere.

Earthy or peaty lignite from Cerele.

Turf from Pianico.

Pine wood charcoal.

Fir wood do.

Beech wood do.

Chesnut wood do.

These four varieties represent the principal part of the fuel consumed in Lombardy.

### *Products from the Royal Furnaces of Allioni, produced from the above Minerals.*

Grey pig iron employed for steel making; it is also used in making cast iron artillery, on account of its great tenacity.

White pig iron for forge purposes.

### *Natural Steel Products.*

Natural steel.

Bar of natural steel.

Do. do. tempered.

Bars of steel untempered.

Bar of natural steel.

Bars of natural steel refined and untempered.

### *Steel produced in the Puddling Furnace.*

Blooms, or unrefined masses of steel.

Hard steel chisel for masons' use.

Plates of steel for carriage springs.

Plates of steely iron for do.

Bars of steel tempered hard.

Bars of untempered steel of different patterns.

*Wrought Iron produced from White Pig Iron in the Puddling Furnace.*

Bloom of rough iron (puddled bars).

Bars of iron (puddler bars).

Bars of merchant iron from the rolling mill.

*Wrought Iron from the same kind of Pig, produced by the "Comtois Forge" Method.*

Bloom of rough iron.

Bars of wrought iron.

Steely iron for agricultural implements obtained in open charcoal forges.

**24.—76. MILESI, ANGELO, Bergamo.**

Iron ores.

Pig iron.

Hard steel, capable of scratching glass, worth from £40 to £48 per ton.

**VALLEY OF AOSTA.**

Only four furnaces are at present in blast in this district, of which are three in the lower, and one in the upper valley of Aosta. The ores are derived from Traversella and Coigne, and are smelted with charcoal. The motive power for the blowing engines is obtained from the Dora river.

A portion of the pig iron produced is converted into bars by means of puddling furnaces, heated by the waste gases from the blast furnace; the reheating is effected in open fires.

The remainder of the pig iron is refined in the "Comtois" furnace, and the iron is worked into bars both by means of hammers and rolling mills, which are also driven by water power.

The price of the ore, delivered at the works, is from 28s. to 32s. per ton; the cost of charcoal is from 48s. to 52s. per ton; while the wages paid are from 2s. 6d. to 3s. per day for smelters at the blast furnaces, 3s. 4d. to 4s. per day for puddlers, and from 1s. 8d. to 2s. for ordinary day labourers.

The railway station of Ivrea is distant about 80 kilometres, or 50 miles, from the upper furnaces, and only 15 kilometres, or 9½ miles, from the works in the lower part of the valley.

The iron of Aosta is of an excellent quality; it is considered to be preferable to the best foreign varieties, for all purposes which require an iron that can be worked cold; the price varies between £18 and £19 4s. per ton.

**25.—3. ALDISIO and Co., Turin.**

Samples of wrought iron bent cold, produced from the magnetic iron ore of Traversella, at the works of Bard (Aosta).

Two rifle barrels wrought cold.

These articles are produced from one of the establishments of the lower valley of Aosta. The works comprise one blast furnace, with a puddling furnace attached, worked by the waste gases, one Comtois furnace, and one small open fire. The ores employed are generally obtained from Traversella, but sometimes those of Coigne are used.

**CENTRAL ITALY.**

The dykes or veins and large irregular masses of iron ore occurring in the metalliferous mountains of Tuscany, are of a very valuable character. The following is a list of the best known of these, classified according to their localities.

The great dykes (or veins) of Frigido, that containing hematite at Corsinello near Stazzema; that of the valley of Castello containing limestone, brown iron ore, and magnetite; and the hematite deposit of Forno-Volasco, in the valley of Arni, in the flank of the great mountain of Tambura.

The numerous limonitic dykes of the territory of Massa, to which the alunites (alum stone) owe their origin.

The great limonitic dyke of Monte Valerio, in the Campegliense country.

The iron deposits of Rio, and those of Longone, and Terra Nera, in Mount Calamita, in the island of Elba.

All the above localities produce an abundance of good ores, but up to the present time they have only been worked in the Island of Elba.

**26.—112. THE JOINT ADMINISTRATION OF THE MINES AND IRON WORKS OF TUSCANY, (*Amministrazione cointeressata delle R. Miniere e Fonderie del Ferro di Toscana*.) Leghorn.**

Two pigs of iron for foundry or forge purposes.

Pigs of iron, containing manganese. Ten bars of iron drawn under the hammer.

Ten bars of iron from the rolling mill, marked F M.

Ten bars of rolled iron, marked E B.

(For description of the Ores see No. 1, page 3.)

The mines of the island of Elba are the

property of the State. After numerous and progressive changes which have been tried, it was considered advisable for their more efficacious working, to have recourse to the aid of private capitalists. The present joint association of private adventurers with the Government was formed in 1851, and the direction of the works was entrusted to Count Pietro Bastogi for a term of 30 years, a power of inspection being reserved to the Government.

Many improvements were introduced on the formation of the association, but the most important changes have been effected during the past three years; and the projected improvements of Mr. Ponsard are of still more recent date.

The iron deposits of Elba, which it need scarcely be said are among the richest in the world, consist chiefly of specular ore (hematite) magnetic and limonite (brown iron ore). The waste heaps of the old workings are also worked to advantage. The present annual production amounts to 48,000 tons, yielding an average from 55 to 60 per cent. of cast-iron. Unfortunately the arrangements, whether for winning, conveyance, weighing, or shipping, are all equally defective, and it would be necessary to make very considerable alterations in each of these particulars before the cost of working could be sensibly reduced, or the production sufficiently increased, to allow of the ore being sold at a price lower than the present rate.

About 21,500 tons of the ore are consumed by the Tuscan provinces, 4,300 tons in the other parts of Italy, while the remaining 22,200 tons are exported to France and England.

Out of the above quantity of 21,500 tons consumed in Tuscany, about 18,000 are worked up in the foundry of Follonica and its two branch establishments at Valpiana and Cecina, during the eight working months of the year, as the unhealthy nature of the localities render them uninhabitable during the four summer months.

The pig-iron obtained from these furnaces is of good quality, and one particular variety, containing a considerable proportion of manganese, is especially adapted for steel making. About one-half of the entire produce of pig-iron is exported, most of it being sent to France. Out of the remaining half, a portion is consumed in Tuscany for railway purposes, and the rest is taken by various Italian establishments and the royal forges for conversion into bar-iron.

Several important improvements have been introduced into the iron-works belonging to the Association at Follonica, and the experimental puddling furnaces and rolling mills which have been in use during the past three years, are now producing about 100 tons monthly, or about 800 tons for the working period of eight months.

Steel making has also been recently introduced by way of experiment. The samples exhibited are sufficient to testify to the excellent quality of the articles produced.

The money value of the ores—iron, steel, &c., annually produced by the Association is constantly increasing, and is estimated at present at £88,000. The number of hands employed in the different establishments amounts to 380, who receive wages varying from 9d. to 5s. per day.

The collection of crystallized minerals and show specimens exhibited by the Association is sufficiently beautiful to attract the attention of the most superficial observer, in addition to its great geological, mineralogical, and economic value.

(See page 3, No. 1).

## 27.—121. \* BOURLON AND Co., Pisa.

Samples of iron ore from Monte Valerio.

This important deposit is known to have been worked at a very remote period, from the fact of the existence of large quantities of iron slags in the vicinity. The workings, after having been recently resumed for a short period, are again suspended.

## 28.—39. FLORENCE ROYAL NATURAL HISTORY MUSEUM (GEOLOGICAL DEPARTMENT), Director, Prof. Igino Cocchi.

Specimens of the iron ore of the valley of Aspra, near Massa Marittima, in Tuscany, belonging to Counts Pietro and Luigi Guicciardini, Brothers, of Florence.

The deposit, which somewhat resembles in character that of Rio, is principally composed of limonite. It was extensively worked during the existence of the Italian Republics of the middle ages.

The proprietors have recently opened a trench on the deposit, from which the ore can be obtained in open cast. A trial sinking has proved the deposit to a depth of 43 yards without finding any change in the character of the ore. About 100 tons of ore were extracted under these circumstances, which have been smelted at the works of Follonica and Colle. The iron produced amounting to 50 per cent. of the weight of the ore, is said to be unequalled in quality, both as regards malleability and ductility.

I. COCCHI.

## 29.—60. JERVIS, W. P.

Magnetic iron, from a vein in Val Fondone (Massa di Carrara).

Veins or dykes of magnetic iron are found extensively in the Lunigiana valley and Versilia, the whole of the marble district of Carrara, Massa, and Seravezza, as well as on the northern flanks of Monte Sagro. The course of the veins is generally from N. to S., their thickness varies from the faintest line up to several yards. On account of the precipitous nature of the mountains it is very difficult to make a thorough examination of the whole of these veins, many of them are found in localities inaccessible to any but practised mountaineers.

The iron mines of the Versilia were formerly worked at eighteen different points, but the system of monopoly established by the grand dukes of Tuscany led to their abandonment. By establishing a system of railways to unite the valleys of the Lunigiana and Versilia with the towns of Carrara, Massa, and Pietrasanta, it would be possible, not only to obtain the marble at one-half of the present price, but also to re-open the iron mines, as although fuel is somewhat scarce an abundance of water power is available for driving machinery, and the railway from Genoa to Naples would offer an easy access to the markets of the whole of the western coast of Italy.

There appears to be a direct relation between the deposits of magnetic iron ore and the metamorphoses of the limestones known as Carrara marble. It has been thought by some persons that this change is due to the action of eruptive serpentine, but in addition to the fact that this particular kind of rock is of very unusual occurrence in the district, it appears from the examination of the iron lodes that the rock enclosing the larger veins preserves its crystalline character to a greater distance from the walls than it does in those of a less thickness. Although in all cases, down to the smallest strings, the crystalline character is apparent along the surface of contact.

At Cape Corvo, the western point of the Gulf of Spezia, numerous dykes of magnetic iron are found in a black limestone, which is altered into a crystalline slate for several hundred yards. This marble cannot be worked on account of the large quantity of iron ore disseminated through it, a fact that appears to me clearly to explain the cause of the existence of the marble of the entire province. I am also of opinion that there exists, at a greater or less depth below the surface, an immense mass of magnetic iron ore, similar and not inferior to that of the island of Elba, which, by its character, has exercised a great influence on the molecular change of the marbles. The fact is, that in Liguria as well as in the Versilia, the Campigliese, and the island of Elba, the veins which contain iron ores occurring in the limestones, are everywhere accompanied by a very white marble.

Some of the iron veins pass gradually into the limestone, producing a very beautiful kind of ornamental marble which is called "*pavonazzo*;" the base is of a white waxy character, taking a high polish, with small veins of magnetic iron ore, which often tinge the surrounding portions of a delicate yellow colour, where the iron is in small quantities, but disseminated through the entire mass of the rock. The marble is very striking, from the capricious convolutions of the variegating veins, but it is then very difficult to work. The principal quarries of this variety are those of Finocchioso, Sponda, and Boccanaglia at Carrara; besides which there is another one at Stazzema.

This marble is adapted for internal decorations, or for situations where it is not exposed to the free action of the air.

Magnetic iron is also found interspersed in distinct octohedral crystals, probably accompanied by specular iron in the limestones, which is occasionally changed into massive carbonate of iron. An example of this kind is to be seen near Massa.

The well-known beautiful marbles of Siena, and the golden veined marbles of Portoro, are variable mixtures of the metamorphous carbonates of protoxide of iron and lime.

W. P. JERVIS.

### 30.—2104. PESARO AGRICULTURAL ACADEMY.

Iron ore from Monte Nerone.

### 31.—146. PIROLI, Prof. ANDREA, Parma.

Micaceous hematite iron ore.

### 32.—95. ROMAN IRON COMPANY (*Società romana delle miniere di ferro*), Rome.

Series of products from its establishment at Terni.

The ores derived from the iron mine of Tolla were formerly smelted in the blast furnace belonging to the company, but at present the works are employed in making wrought-iron from pig-iron obtained from Follonica and abroad.

Iron wire of an excellent quality made at Tivoli, is also exhibited.

The refractory bricks exhibited by the same company, are intended for lining the interior of blast furnaces. They are made of the decomposed trachytic rock of La Tolia.

## SOUTHERN ITALY.

Deposits of iron ore are found in the southern part of the Apennines, both in the state of magnetite and of the hydrated peroxide. They occur more especially in the crystalline rocks of the Calabrias, but are also found in the sedimentary rocks of the Abruzzi, and even in the tertiary hills of Apulia. Only the more important deposits will be noticed here.

The only mine which is now at work is that of Pazzano, which is briefly described below, No. 35. The next most important one is that of Aspromonte, in Calabria Ultra I., about three hours' journey from Bagnara, near the village of S. Euphemia, where magnetite is found in veins and irregular masses, scattered through a very ferruginous gneiss.

Under the late Neapolitan government, exploratory workings were commenced at this spot, but their suspension, which was brought about by the political changes of the country, has left us without any exact idea of the extent or value of the deposit. Wood is obtainable from forests situated at a distance of eight miles, and there is a sufficient supply of water during the winter months for furnishing motive power for the necessary machinery. A few experiments were made with this ore in a Catalan forge at the foundry of Mongiana, which resulted in the production of a steely iron of good quality.

Limonite is found in the neighbouring mountains between the Abruzzi and the Terra di Lavoro, in the district near Picinisco, Settefrati, San Donato, Alvito, and other places. A foundry was recently established by the government for the reduction of the ores produced in these mountainous regions, but in consequence of recent political events the works have been suspended.

O. COSTA.

**33.—43. GABRIELE, ANTONIO,**  
*San Bartolomeo in Galdo (Benevento).*

**34.—55. GUPPY AND PATTISON,**  
*Naples.*

Samples of iron, bent cold.

**35.—81. NAPLES ROYAL  
FOUNDRY.**

Iron ores smelted in the royalsmelt-  
ing works; samples of the pig iron  
produced.

This metallurgical establishment is supplied  
with ore from the limonite mine of Pazzano,  
situated in the mountains of Stilo, in Upper  
Calabria 2, near Monte Stella.

The extent of this deposit, as far as its for-  
mation allows it to be ascertained, is about  
eight miles, with thickness at the surface  
of 16 feet in some places. It is included  
between a roof of Apennine limestone and a  
floor of argillaceous and sandy slate; the dip  
of the beds being between 40° and 50°.

The ore is transported to Mongiana, where  
there are three blast furnaces, which have  
been at work for a considerable period.  
Another furnace has recently been built at  
Ferdinandea, a few miles distant from the  
mine.

At the establishment of Mongiana a con-  
siderable quantity of castings are produced;  
they are principally projectiles for the artillery,  
which are cast directly from the blast furnace.  
Bar iron is also produced at Mongiana, in the  
Comtois and Bergamasco furnaces, which are  
heated with charcoal.

The iron obtained is of an excellent quality,  
and is employed in the small arms factory at  
Mongiana, and the arsenals of Naples and  
Castellamare.

**36.—140.\* NAPLES, SUB-COMMIT-  
TEE FOR THE EXHIBITION.**

Sand, containing magnetic iron, from  
the shores of the Gulfs of Naples  
and Salerno.

The sands of the shores of parts of the Gulfs  
of Naples and Salerno contain magnetic and  
titanic iron ores, which, in some cases, form as  
much as 20 per cent. of the whole mass. As  
these sands are already classified according to  
size, and are also completely dry, it would be  
easy to separate the iron ore from them by  
means of a simple magnetic arrangement,  
and thus to obtain a substance fitted for the  
production of steely iron.

C. PERAZZI.

## ISLAND OF SARDINIA.

**37.—8. BELTRAMI, COUNT PIE-  
TRO, Cagliari.**

Iron ores from Seddori, Buggero,  
Perda-Niedda, Arenas, Turri-  
bino, and Gonnessa.

These consist of magnetite and hematite,  
the first of which is obtained from granite,  
and the other from the silurian rocks. A  
portion of them are employed in a foundry  
that has been recently established at Domus  
Novas, in a county abounding with forests and  
water courses.

**38.—88. PETIN GAUDET AND Co., Cagliari.**

Magnetic ore, containing 75 per cent. of iron, from the mine of Is-Ginestras.

Silurian slates.

Silurian and metamorphic slates.

Matrix of the vein.

Magnetite, containing 70 per cent. of iron, from the mine of Perda-Niedda, near Iglesias.

Granite, in which the vein is found.

The ores of Is-Ginestras are obtained from a great mass of magnetite, contained in the silurian rocks; the same mineral is found at Perda-Niedda, both in the granite and in the silurian slates; this latter locality is situated in the midst of large forests of oak.

The same firm are also the proprietors of a deposit of magnetic ore at Capoterra, near Cagliari, which is likely to be of great value. In all of the above cases the workings have only been recently commenced.

**39.—107. SPANO, LUIGI, Oristano (Cagliari).**

Iron ores.

§ 2. IRON PYRITES.

**40.—89. PISTILLI, F., Campobasso.**

Iron pyrites from the commune of Salcito, at Campobasso (Molise).

**41.—103. SCLOPIS, BROTHERS, Turin.**

Iron pyrites, from the mine of Brozzo (Ivrea).

Plan of the workings of the mine.

Specimens of magnesian earth.

The mine from which these specimens are obtained produces at the present moment about 2,200 tons per annum of iron pyrites free from arsenic. The yield could easily be increased to 1,000 tons per month if, by means of an improved communication, an outlet was to be found for it in foreign countries.

The mine is about 5 miles from the railway station of Ivrea,  $4\frac{1}{2}$  miles of which can be travelled by carriages, the remaining  $\frac{1}{2}$  of a mile is only provided with a mule track. The cost of working amounts to between 2s. 6d. and 3s. 4d. per ton, and the plan of the workings exhibited shows the extent and importance of the deposit.

Twelve furnaces are erected at the mine for the calcination of the brittle portions of the ore, from which sulphate of iron is made; the more compact variety is sent to the chemical works belonging to the firm in Turin, where it is used for the production of sulphuric acid.

The chemical manufactory, which was established in 1812, has three series of lead chambers, the largest measuring 130 feet by 20 feet by  $17\frac{3}{4}$  feet, which are capable of producing six tons of sulphuric acid daily, of a strength of  $50^{\circ}$  to  $52^{\circ}$ . Of this quantity about  $2\frac{1}{2}$  tons are concentrated up to  $66^{\circ}$  in a platinum boiler, and about 1 ton is sold, of the strength of  $60^{\circ}$ ; the remainder is used for making sulphates of iron, magnesia, and copper, which are annually produced to the extent of about 280 tons.

C. PERAZZI.

**42.—107. SPANO, LUIGI, Oristano (Cagliari).**

Iron pyrites.

§ 3. COPPER.

The total production of the Italian copper mines at present at work may be estimated at little more than 1,100 tons of metal annually, that is to say:—

Copper produced in Italian smelting works . . . . .	600 tons.
2,500 tons of ore exported to foreign countries, containing 20 per cent. . . . .	500 „

Total amount of metallic copper 1,100 tons.

The following are the principal mines which make up the above quantity:—Monte Catini, in the valley of Cecina, Tuscany, producing yearly 1,500 tons of ore, yielding 30 per cent.; Ollomond, Saint Marcel, and Champ du Praz, in the valley of Aosta, where 260 tons of copper have been annually produced for the last five years, from ores containing on an average from 3 to 5 per cent.; Capanne, Poggio Bindo, and Fenice, in the Massetano, Tuscany, producing together 2,500 tons of 10 per cent. ores; Maggiandone, in the valley of Toce, yielding 350 tons at 7 per cent.; Traversella, Ivrea, giving about 100 tons of magnetite, containing from 8 to 9 per cent of copper; and, lastly, about 500 tons, containing an average amount of 16 per cent.,

are obtained in various exploratory workings in the serpentine rocks of Liguria, Tuscany, and the Bolognese Apennines.

There are five copper smelting establishments in Italy; S. Marcel and Donnas, belonging to the "Exploratrice" company to which is added a rolling mill; Valpelliana, belonging to the Ollomond company; La Briglia, which is the property of the Monte-Catini company; and lastly, Capanne Vecchie, where the process of Messrs. Bechi and Haupt is employed.

The abundant indications of the existence of copper ores in the serpentinous mountains of central Italy, together with the regular continuity and increasing richness of the veins in Tuscany, Liguria, and the Bolognese Apennines, will probably lead to a great extension of profitable mining enterprises in these countries at some future period. The scarcity of fuel is of less consequence in this case, as most of the veins produce very rich ores; and as the greater part of the mines, more especially those of Liguria, are situated near the sea, the ores can be profitably exported to foreign countries.

The separation of the copper pyrites contained in the magnetic iron ore of Traversella, is successfully performed in the establishment belonging to Chevalier Riccardi, by means of the electric separator invented by Mr. Sella, who is now the financial minister of Italy.

Another process for the treatment of poor ores, which is due to Messrs. Bechi and Haupt, is now employed for the separation of copper from poor ores. It consists in roasting poor pyritic ore with an addition of salt, by which the sulphurets are converted into chlorides; and the chloride of copper so obtained is afterwards reduced from a watery solution by means of cementation with iron. By this means large quantities of poor ores, which were formerly abandoned, are now worked with a profit.

#### VAL SASSINA.

#### 43.—108. STREIFF, G., and Co., Bergamo.

Copper ores from the Valley of Sassina.

The specimens exhibited have been obtained from a vein occurring in the micaceous quartz rock of the valley of Sassina, in the province of Como. The workings, which were merely of an exploratory character, have been abandoned owing to the want of sufficient capital for carrying them on on a large scale.

#### VALTOCE AND LAGO MAGGIORE.

#### 44.—114. VICTOR EMMANUEL MINING COMPANY, (*Società Vittorio Emanuele*), Pallanza (Novara).

Copper ores from the mines of Miggiandone and Baveno (Pallanza).

This Company, which was formed in London, under the provisions of the Limited Liability Act, with a capital of £45,000, divided into £1 shares, possesses the following mines.

#### MIGGIANDONE MINES.

The workings at this place were commenced in 1858, on a powerful vein, bearing large quantities of magnetic pyrites and copper pyrites, which traverses in a general E. and W. line the hornblende and micaceous rocks forming the mountains of Miggiandone. The copper pyrites is found in rich balls or zones, the character of which is well seen in the specimens exhibited.

The amount of ore raised during the past

year was 350 tons, containing on an average about 7 per cent. It was exported to England.

This mine promises well for the future. The working is conducted with great skill by the resident engineer, Mr. E. Frankfort, who has already discovered a large extent of ore-bearing ground. About 90 hands are employed.

#### BAVENO MINE.

The concession of this mine includes three known veins, the most important having been worked at the commencement of the present century, but the difficulties arising from bad air and the want of adequate draining power led to its abandonment, after large quantities of copper pyrites had been obtained. The present owners purchased the mine in July, 1861, and are now engaged in draining the old workings, the depth of which does not exceed 65 yards.

There is every reason to believe that this will become one of the most important mines in Italy, as the principal vein appears to be very uniform in character, with an average width of 9 to 10 feet; it is situated in the neighbourhood of the junction of the Baveno granite with the silurian slates. The copper pyrites produced is very rich, being free from any admixture of iron pyrites.

The samples exhibited are good characteristic veinstones. Sixty persons are employed in the works, among whom are several English miners.

C. PERAZZI.

#### 45.—109. TALACCHINI, ALESSANDRO, and Co., Milan.

Magnetic pyrites, containing copper pyrites, from the mine of Nibbio (Pallanza).

This mine is situated on the left bank of the Toce, almost opposite to that of Miggian-done. The vein, which passes in an E. and W. direction through similar metamorphic hornblende of micaceous rocks, and yields copper pyrites and nickeliferous magnetic pyrites, has only been imperfectly worked for several years past, but operations on a more extended scale have been commenced by the present proprietors. C. PERAZZI.

#### VALLEYS OF AOSTA AND TRAVERSILLA.

#### 46.—84. OLLOMOND MINING COMPANY (*Società delle miniere di Ollomond*), Aosta.

Copper ore (copper pyrites).  
Rough undressed ore.  
Crushed ore.  
Crushed and roasted ore.  
Coarse or black copper.  
Refined copper.  
Copper run into a stalactitic form.  
Wrought copper.

This company was formed in 1851 for the purpose of working the copper mines of Ollomond, known by the name of San-Giovanini and Balme.

The specimen exhibited by the School of Applied Engineering fairly represents the nature of the ore, which is composed principally of copper pyrites, iron pyrites, and garnet, in a gangue of chlorite hornblende and talc, with an occasional admixture of quartz. The mine buildings are very extensive, including houses for the workpeople, large storehouses, a small forge with tilt hammer, and a carpenters' shop. A railway from the mouth of the mine conveys the ores to the dressing floor, which contains nine stamp heads, ten fixed tables (flat buddles), and one round buddle.

The dressed ore, containing from 6 to 8 per cent., is reduced at the smelting works of Valpelliana, which are situated about three-quarters of a mile lower down the valley.

These works contain twenty-four roasting furnaces, with flue-condensing chambers; four small blast furnaces (half furnace), for ore smelting; a furnace (*fourneau à manche*), for producing black copper; a reverberatory refining furnace; and a blowing-engine, driven by water power.

The fuel employed is charcoal, costing about £2 per ton.

The works are about six-and-a-half miles distant from Aosta, on a mule road. The town of Aosta is  $4\frac{1}{2}$  miles from the Ivrea railway.

The number of hands employed by the

company is between 210 and 220; the present production of copper is 10 tons per month, 550 tons have been produced during the last five years.

#### 47.—2086. RICCARDI DI NETRO, ERNESTO, Turin.

Magnetic iron ore containing copper pyrites from Traversella.

Samples of rough crushed ore, and ore dressed by the electric separator.

Drawings of the electric separator.

The mine of Traversella is an extremely important one, whether we regard it from an economic or a scientific point of view. It is situated  $12\frac{1}{2}$  miles from the Ivrea railway, on the western slope of the ridge dividing the valley of Chiussella from that of Aosta, in the gorge of the torrent of Bersella, in syenite and talco-micaceous slates, with interstratified dolomitic beds.

The deposit is a large and essentially crystalline mass, composed principally of magnetic iron ore, and containing an extraordinary profusion of finely-crystallized minerals, which have contributed largely to the adornment of the principal mineralogical collections of Europe.

The general direction of the strike of the deposit is from  $28^{\circ}$  E. of S. to N.,  $29^{\circ}$  W., with a depth varying between 47 and  $57^{\circ}$ ; the thickness is from 65 to 100 feet. The ore has been removed to a depth of 216 yards from along a length of about a quarter of a mile. The centre of the mass is of an ellipsoidal form, and is composed of an extremely pure variety of magnetite, accompanied by a little dolomite, and yielding 48 to 50 per cent. of pig iron.

From the ellipsoidal centre proceed various ramifying branches, in which the ore changes in composition, being more or less charged with copper pyrites. The workings of this mine date from the earliest antiquity; the total horizontal length of the workings amounts to more than 40 miles. Up to within a few years, the iron ore alone was worked, the annual produce having been maintained for a long time at 8,500 tons. During the last ten years, however, it has fallen to 4,000 tons, on account of the stoppage of several of the iron works of the lower valley of Aosta. As, however, very large masses of mixed ore were discovered at different points of the mine, the Chevalier Riccardi di Netro, in 1854, caused a series of experiments to be undertaken by Mr. Q. Sella, with a view to their realisation.

The result of these experiments has been the invention of the electric separator, which has now been regularly employed for two

years; two others have been added subsequently. The three machines produce about 35 tons of ore per month, containing 8 per cent. of copper.

One ton of mixed ore, containing about 3.1 per cent. of copper, when stamped and sized, yields  $4\frac{1}{2}$  cwt. of ore at 9.3 per cent., and  $15\frac{1}{2}$  cwt. with 1.3 per cent. at a cost of about 4s. 6d., of which 1s. 6d. is chargeable to the crushing and sizing process, and the remaining 3s. to the electric separator.

In addition to the above, the dressing machinery comprises a crusher with one pair of rollers, four sizing drums (trommels), two sieves, three shaking tables, and two fixed tables, the whole of which are driven by a turbine of 18 effective horse power. There is also a small smelting establishment with two furnaces.

#### 48.—2097.\* SCHOOL OF APPLIED ENGINEERING (*Scuola di applicazione degl' Ingegneri*), Turin.

Copper pyrites from the mine of S. Marcel (valley of Aosta).

The ores supplying the smelting works belonging to the "Explorative" Company, are obtained from the mines of Saint Marcel and Champ de Praz, in the valley of Aosta. They contain on an average about 3 per cent., being composed of copper pyrites, iron pyrites, and iron garnets, in imperfectly formed crystals, in a gangue of chlorite, calc. and hornblende.

The mine of S. Marcel is connected by a special road with the dressing-floor, which was built two years ago near the village of Saint Marcel. The motive power is furnished by two water wheels, together of 80 horse-power, which are driven by the water of the Dora river. The dressing machinery comprises

three pairs of crushing rollers, nine sorting drums (*trommels*), five double sieves, twelve shaking tables, and two fixed tables.

The poorer ores are concentrated by a preliminary in two smaller blast furnaces (*fourneaux à manche*), the regulus so obtained is sent, together with the richer ores, to the smelting works of Donnas, about 22 miles lower down the valley.

The ores from Champ de Praz are treated in the same place, they are sent down from the mine to the bed of the valley by a sledge road, and from thence to Donnas, a distance of about seven and a half miles, by the national high road.

At the smelting works, the ores and regulus are roasted in eight calcining furnaces provided with condensing chambers; a reverberatory furnace with two beds is employed for the finely-divided ores; the fusion is effected in four low blast furnaces, and the refining is conducted in a reverberatory furnace, on the English plan. A turbine of 30 horse-power drives the blowing engines, an exhausting fan for drawing the gases from the condensing chambers, and the machinery contained in the repairing shops.

Up to the present time, charcoal has been employed in the fusion furnaces, and wood for all other operations, but in consequence of the high price of these fuels, the company have determined to introduce the use of English coke in the place of charcoal, and coal for the reverberatory furnaces, although the works are  $12\frac{1}{2}$  miles from the railway terminus of Ivrea, which is  $137\frac{1}{2}$  miles from Genoa.

A rolling-mill, driven by water-power, has been added to the works during the past year, and has recently been set to work with very favourable results. The total quantity of copper produced exceeds 700 tons.

C. PERAZZI.

#### EASTERN LIGURIA.

The important works which have been lately undertaken in the serpentine mountains of Eastern Liguria, have demonstrated that the numerous deposited copper ores, which have hitherto been regarded as irregular, and of trifling value, are really continuous in depth, and that they increase in value and regularity when followed below the surface.

The deposits occurring in the metamorphic slaty rocks, and in euphotide and diorite (hornblende and diallage-augite porphyres), present the characters of true veins, the different minerals being sometimes arranged with a riband structure, and containing geodes of crystals. In this case they almost always contain quartz and a small quantity of blende; the copper pyrites is very pure, and is generally of a crystalline character; the lateral veins, branching off into the euphotide, are rich in purple copper ore (erubescite).

On passing into a serpentine country the same vein loses its quartz, and with it the character of a riband lode disappears. The ore is then found in zones, kernels, irregular masses, sometimes of great size, or even in discontinuous sheets, which are covered by a thin film of serpentine. The copper pyrites is of a compact iron crystalline character, and is of less value, on account of the large admixture of iron pyrites; geodes and crystals are very rare.

In the lodes following the lines of contact of the eruptive with the metamorphic rocks, the structure is of a special nature, with more or less of the characters which are observed when they are wholly contained in one or other of the different rocks.

There are two different groups of these lodes. The dominant direction of that which includes the richest veins of Tuscany and Liguria, is from E. to W.; the other group has a general N. and S. course. The lateral ramifications and strings from these veins are not amenable to any general law, the main lodes have also undergone a large amount of dislocation, but in all cases where workings have been undertaken on well-defined lodes following one or other of the above courses, ore has been produced in quantities increasing with the depth.

If we desire to formularize an opinion from the result of the observations of several years on the copper lodes of Liguria, we may say that they constitute two systems of E. and W., and N. and S. veins, which have been formed in the same manner as the most regular veins of other countries, and that they have been filled by different classes of minerals according to the varying chemical influences of the containing rocks.

There is no doubt that this country offers an attractive field to the speculative capitalist, as the mineral districts are within easy reach of the sea, and will shortly be traversed by the railway to Eastern Liguria.

C. PERAZZI.

**49.—119.\* ACERBI, GIOVANNI, Sarzana (Genoa).**

Copper pyrites from the district of Zeri.

**50.—147.\* PODESTÀ, BARTOLOMEO Sarzana (Genoa).**

Copper ore from the mines of Bracco.

**51.—2087.\* REMEDI, MARQUIS ANGELO, Sarzana (Genoa).**

Various specimens of copper ores from the mine of Marciiani.

**BOLOGNESE APENNINES.**

**52.—11. MINERALOGICAL COMPANY OF BOLOGNA, (Società mineralogica di Bologna).**

Copper pyrites and purple copper ore (Philipsite), from the mine of Bisano (Monterenzo-Bologna).

Serpentine, euphotide, clays, and serpentinitous and steatic conglomerates, accompanying the vein.

Plan and section of the workings.

The rocks in which this mine is worked belong to the zone surrounding the Apennines on the northern and eastern slopes, which has been described by Professor Bianconi under the name of scaly clays, and which, according to M. Scarabelli, are of upper eocene date. At Bisano the bed of the Idice separates these strata from the higher lying miocene molasse which immediately overlies them at Ca-Quadroni, where the principal shaft is sunk.

The ground, in which the workings are carried on, is composed principally of clays, with irregular interstratifications of *alberese*, in which are found occasional serpentinitous

veins, composed of mixtures of serpentine with carbonate of lime and silica, which are often metalliferous in a very irregular manner; sometimes containing very rich accumulations of copper pyrites and purple copper ore.

One of these veins, near the outcrop of which the first shaft was sunk, has several tons of purple copper ore of the richest quality.

A similar vein, producing large quantities of copper pyrites, has been followed for a long distance in a N.E. and S.W. direction, and it has been worked on the plane of the north-westerly dip at seven different levels, which are united together by various intermediate shafts and winzes; the principal shaft has already been sunk to 190 yards, and will be continued to a greater depth.

The gangue filling the veins is a breccia of fragments of serpentinitous and crystalline rocks, such as ophiolite or diallagic serpentine, ranocliara, euphotide, and diorite, cemented together by a mixture of serpentine silica and carbonate of lime, and numerous small steatic veins. Although tolerably constant in their dip and strike, they are of very variable width, and it is more especially in the occasional great expansions that the rich deposits of copper ore are found.

The surrounded rocks are more or less altered in the neighbourhood of the veins. The clays and limestones are coloured red by them, and pass through various gradations into the rock known as "gabbro rosso." In addition to the charcoal changes, the works have undergone considerable mechanical alteration, the clays being converted by compression into hard rocks, with polished surfaces.

The reddening of the clays, together with the alteration of the rocks, form excellent guides to the discovery of the continuation of a vein that has been diminished to a thin string, or has wholly disappeared.

These veins are of miocene date, and the serpentinitous mass filling them has probably been formed by joint igneous and aqueous metamorphic action, the aqueous action ap-

pears to have been more decided in those portions which traverse the upper eocene rocks.

The export of ore to Liverpool has as yet only amounted to 100 tons, but the extensive amount of new ground recently opened out gives every prospect of shortly yielding large quantities of valuable ore.

The present extension of the underground working is the result of the expenditure of comparatively small amounts, both of time and money, as the rock is of a moderate hardness, and the draining of the workings is easily effected.

G. MENEGHINI.

#### CENTRAL ITALY.

#### 53.—22. CHIOSTRI, LORENZO, *Pomaranace (Pisa)*.

Specimens of rocks and minerals from the vicinity of Pomaranace and Libbiano.

Geological map of the district.

Plans and sections of the mines at Libbiano and Castagno; the latter is exhibited by Dr. Chiostrì as the engineer of the Anglo-Tuscan Mining Company.

This collection, illustrative of the mines of the Anglo-Tuscan Mining Company, is additionally interesting for the information it affords relating to the chronology of the serpentine formation and the veins which occur in it.

The compound of serpentine and diallage, known by the name of ophiolite, occurs in the district in the form of great eruptive masses traversing the cretaceous and lower eocene rocks (*pietra forte and alberese*), the sedimentary rocks being often broken up and included between igneous masses.

The ophiolite is disturbed by another diallage porphyry or euphotide, which is seen in intrusive dykes, productive of more or less alteration, turning the ophiolite into *ranochiara* at the surfaces of contact.

A third series of dykes, formed of prasopire, or serpentine, rendered porphyritic by interspersed crystals of felspar, which has sometimes the character of a diorite or diabase, is of later date. They are seen penetrating both the ophiolite and euphotide.

Veins containing copper pyrites are found penetrating all the three kinds of rocks, and are also occasionally found included between two dissimilar mineral masses, as if occupying a fracture formed along the plane of least resistance.

The general strike of these lodes is from E.S.E. to W.N.W. In the neighbourhood of

Castagno they vary considerably in their dip, and it is only by making large allowances for local irregularities that any general inclination can be assigned to them. In like manner their thickness, whether in depth or along the strike, is very variable, and the vein may often be represented, both in plan and section, by a series of expansions united by narrow threads or strings, bearing a fancied resemblance to a rosary or chaplet.

Another serpentine rock, which does not contain diallage, and is posterior in date to the mineral veins, as well as to the rocks already described, is found more especially at the point of contact of the pre-existing eruptive rocks with the sedimentary strata, and these points are highly metalliferous.—(*Aia al cerro*.)

But the small veins of this metalliferous serpentine, which are more or less steatitic, and contain crystalline calc spar, iron, magnetite, and copper pyrites, arrayed usually in a striped or banded form, are found penetrating all the preceding formations, usually taking parallel courses, or even invading the injected veins.

The examples of the last-mentioned fact, which are furnished by the mine of Castagno, are very important and instructive. In the principal gallery of the second level, known as the Roman gallery, numbers of injected veins were discovered following the normal direction, some of which were sufficiently large to be advantageously worked, which, in the first level or Maria Tobler gallery, only one of these small veins was found, and with it an injected vein, which was very irregular and much dislocated, a circumstance due less to its original irregular character than to the invasion of an eruptive mass of later date. The continuation of the workings exhibits the relation of the part of the vein so altered to the part which is seen in the Roman gallery, near which a shaft has been sunk, which at first served only for communication between the different levels, but which has since been driven through to the surface. These workings have been temporarily abandoned, on account of the excessive quantity of water rendering it necessary to concentrate the working strength on the driving of the adit level, which, when completed, will drain the ground to a depth of 150 feet below the present lower workings.

In the region where it has been examined, the vein appears in every gradation, from its original integrity to complete union with the substance of the later hydro-plutonic mass, and large and small angular fragments of the veinstone, sometimes in close proximity and reunited, are found in the adjoining rocks.

The alteration produced by an eruption of metalliferous serpentine is also visible in the ophiolite forming the walls of the injected veins, which is fractured in all directions; a

circumstance which gives rise to much difficulty in searching for the continuation of veins, which have become reduced to a thin string, and are further complicated by the alteration produced by the invasion of newer veins.

The presence of red ochreous scales and crystallised hematite, always accompanied by magnetic pyrites, is found in practice to be a guide to the recovery of the last deposit. (*Della presenza del ferro ologisto nei giacimenti ofiolitici della Toscana*, MENEGBINI, 1860.)

A further and more potent cause of disturbance and mechanical derangement is to be found in the great oscillatory movements that the ophiolitic masses have undergone at a later and comparatively recent period, by which both the injected and the serpentino-cupreous veins have been broken up and faulted, both laterally and more generally in depth.

These dislocations are rarely of large amount, but, as they are combined with the complications already noticed, as well as the mechanical and chemical alterations of the rocks, they are a great additional difficulty to the underground explorer.

The movements last mentioned are intimately connected with the appearance of a new order of formations, generally of an ophiolitic nature and of hydro-plutonic origin, which present themselves under very variable lithological characters, in the form of great eruptive dykes coming from unknown depths, which penetrate sometimes, without reaching the surface, the whole of the rocks already described, and the adjacent sedimentary strata, some of which are of miocene age.

The same dyke at one point, as, for instance, along the road from La Trossa to Libbiano, is entirely composed of fragments of eruptive, sedimentary, and metamorphic rocks, intimately compacted by a serpentine-calcareous cement, into a conglomerate or coarse "gonfolite," changes its character at a short distance beyond Libbiano, passing through several intermediate gradations. The nature of the changes is as follows: the included fragments, among which are found pieces of the metalliferous serpentine, without diallage, decrease in size, and assume a uniformly vinous red colour; the cementing material becomes more homogeneous and ferruginous, and the whole mass shows a tendency to separate in concentric laminae from the production of a coarsely spheroidal structure.

Further on, the mass becomes redder and more compact, and is sometimes areolar. Small kernels of calc spar are occasionally found filling the cavities after the manner of an amygdaloid. The red colour is similar to that of the adjacent calcareous and argillaceous rocks, which have preserved their places, but are somewhat altered in the vicinity of the erupted mass.

In another place, on the Trossa, at the

confluence of the Suolo, the dyke is chiefly composed of masses of euphotide and diabase, which are penetrated in different directions by large veins of copper pyrites. These masses are united by an argillaceous serpentiniferous substance, which has been greatly altered by subsequent pressure and disturbance.

A very similar series of rocks is seen in the so-called cemented dykes, like that of Monte Catini. The workings at Botticella, near the mine of Caggio, at Monte-Rufoli, belonging to Mr. Cioili, have been undertaken for the exploration of one of these dykes, which has been found to contain a considerable quantity of metalliferous nodules, which are really fragments of the older injected and serpentino-cupreous veins, embedded in a characteristic argillaceous steatitic base, resulting from the complete decomposition of the adjacent ophiolitic rocks.

But it is at this point, which may be considered as the extreme limit of mechanical change, that an opposing chemical influence comes into play, and the elements of the former rocks are re-arranged under the hydro-plutonic action into a new crystalline compound, a sort of euphotide, in which the diallage is associated with labradorite fcl-par instead of saussurite, as is the case in the older varieties.

This secondary eruptive euphotide, which has already been observed in other places (*Sasso nero* of the Bolognese Apennines; see the *Rapporto sulla miniera di Bisano*, and also that *sul macigno ofiolitico*, &c., 1860), is well developed at Castagno. The dyke dips to the south-west, at a lower angle than the injected veins.

The workings at Castagno were commenced about two years since, and there has been exported by way of experiment about 15 tons of ore containing  $12\frac{1}{2}$  per cent. of copper.

G. MENEGBINI.

## 54.—21. COJARI, VINCENZO, *Fivizzano* (*Massa Carrara*).

Copper ore from the vein of San-Giorgio, Ajola, Fivizzano.

The results of the trial workings on the veins of San Giorgio and Ajola, have been hitherto unsatisfactory, although the existence of ore is fully proved. That is not the only point in which the vein is found to be ore-bearing; and it has been continuously followed as far as the valley of Fondone, beyond Massa di Carrara, where there appear to be traces of its further extension. In its northerly direction the quartzose vein becomes poor in minerals, but it has yielded a quantity of earthy quartz which is used in the porcelain works belonging to the Marquis Ginori Lisci, at Doccia, near Florence. W. P. JERVIS.

# 55.—122. COJOLI, ENRICO, *Le-ghorn*.

Copper ores from the mines of Caggio, at Monte Rufoli, Pisa.

Lignite from the mine of Podernuovo, Pisa.

Sample of an injected vein of copper pyrites containing from 22 to 30 per cent. of copper.

The vein producing the above ores occurs in the old serpentine, or that containing diallage, which in the neighbourhood of the vein is filled with parallel cracks containing steatitic fragments, an appearance usually considered by the local miners to be indicative of a metalliferous deposit.

The thickness of the vein varies from a few feet to a thin thread; it is sometimes altogether absent, in which case the crack containing it is often left empty for a considerable distance.

The workings have been extended at different levels in an east and west direction for several hundred yards; the lowest levels are about 190 yards from the surface. About 200 tons of ore have been exported to London and Liverpool, yielding by assay from 16 to 18 per cent. of copper.

In addition to the above vein and parallel ores belonging to the same system, others are known to exist.

The first of these is a system which has also been injected, following a north and south line with a westerly dip, and it is on the bunch of these veins, the thickest being about 8 inches, that the principal workings are concentrated.

The second class of cupreous deposits is formed by small veins of serpentine, steatite, calc spar, copper, iron, and magnetic pyrites, varying very much in thickness, and whose course has not yet been determined. The multiplicity of their mineral contents, their crystalline character and banded structure, show them to be distinct from the injected veins which they penetrate, a fact proving their posterior origin.

In some cases the new vein follows the course of the older one for a considerable distance, reducing it to a mass of angular fragments, which are cemented by the material of the more recent intruder.

The deep workings of the mine have led to the discovery of a great cemented dyke identical with that which is worked with great advantage at Monte-Catini. This dyke describes a curved path and disturbs the first system of injected veins in one direction on the strike, and in the other in depth. Several accumulations of metalliferous nodules have been found in it.

The working of this mine was commenced

six years since. It is composed of 10 different levels, the lowest being 190 yards deep. The principal shaft is provided with a steam engine of 16 horse-power fed by the lignite of the neighbouring mine of Podernuovo. All the galleries excepting the lower one are in direct communication with this shaft, and in addition to a large number of winzes and other internal communications there are two other day shafts.

The workings are carried on by the proprietor, Mr. Eurico Cojoli, with the help of associated capital.

# 56.—2102. GINORI LISCI, (Marquis), *Florence*.

Copper ore from Querceto, near Volterra.

# 57.—2094.\* SLOANE, HALL BROTHERS, AND COPPI, *Florence*.

Copper ore from Monte Catini mine.

This mine is situated in the serpentine mountains of Caporciano, about eight miles from Volterra, and about 35 from Pisa, at an elevation of nearly 1,500 feet above the sea level.

The total horizontal extension of the workings is about two miles, and the vein has been followed along the strike for about 650 yards, and to a depth of about 200 yards.

The following table shows the produce up to the present time:—

From 1830 to 1833	457 tons.
" 1834 " 1837	119 "
" 1838 " Sept. 1861	28,443 "

Or a total amount of 29,019 tons, with an average content of 30 per cent. of copper.

The vein is found in a metamorphic argillaceous rock, known as *Gabbro rosso*. It follows an east and west course, with a northerly dip of 45° down to the depth of 130 yards, when it turns to the southward at an angle of from 40° to 50°. The thickness at the outcrop is very small, but it goes on increasing in depth up to the point where the change in inclination occurs, where it is about 100 feet. In the present lower workings 195 feet deep, it is about 32 feet thick.

A mixture of fragments of gabbro, argillaceous slates (*galestri*), cupritide, and diorite, crystals of felspar, and nodules of serpentine with and without diallage, forms the gangue filling this singular vein. The fragments are sometimes very small and sometimes of greater volume, but they are usually rounded at the corners and present shining surfaces.

In this fragmentary vein stuff, copper pyrites, sulphide of copper, and purple copper ore,

are usually present in irregular masses, which are often of small size, but enormous ones have occasionally been found that have yielded from 190 to 280 cubic feet of solid ore of the richest quality. These masses follow a general direction, inclined obliquely and diagonally to the axis of the vein, which portion they preserve in the numerous contortions to which the vein is subjected; they are usually found near one of the sides, and more especially on the sides, of the foot wall. Sometimes the fragments of rock, forming the gangue mass, are in themselves metalliferous from the presence of small strings of ore, which have evidently been introduced when the rock was in place. The walls of the vein are usually lined with partings of a bright polished argillaceous shale, a structure resulting from the rubbing motion produced at the time the vein was formed.

In addition to the above extremely rich deposit, there is a string which branches off at the point where the change in dip takes place, and extends to the south, with a dip of from  $25^{\circ}$  to  $30^{\circ}$ ; it is of variable thickness, and almost entirely composed of purple copper ore, and purple pyrites in fragments, alternating with small seams of a friable and decomposed argillaceous rock, while the serpentinous fragments characterizing the main vein are entirely wanting.

The workings are carried on at six different levels, 69 feet (21 metres) apart, which communicate with a principal shaft provided with a steam engine of 25 horse-power.

The ore is extracted from the fragmentary mass of the vein by means of transverse galleries, which are driven in succession side by side. When the ore is removed from the first one it is filled up with dead rock and rubbish obtained during the driving of the second, and so on. In other cases the galleries are driven one above another, and the rubbish is thrown down to fill up the lower ones which have been worked out first. Very little powder is used.

A dressing floor is attached to the mine.

A smelting works, in the valley of Bisenzio, at Briglia, where a portion of the ores are reduced, belongs to the same proprietors.

The whole of the works, forming one of the most important industrial enterprises in Italy, are under the able direction of Mr. A. Schneider.

C. PERAZZI.

#### ISLAND OF ELBA.

#### 58.—130\*. FORESI, LUCIANO. *Portoferraio (Leghorn).*

Native copper from Santa Lucia  
(Elba).

Copper from Volterraio (Elba).

Copper pyrites from Pomonte.

Sulphide of Antimony from Procchio (Elba.)

Map of the localities.

Copper is found at many places in the island of Elba, although no workings are carried on at any of them. The reason of this is to be ascribed, not to the unfavourable character of the deposits, but to the fact, that the former grand ducal government of Tuscany, the owner of all the mineral veins of the island, was disinclined to open any new workings, being contented with the large profit yielded by the iron mines of Rio.

After ten years of considerable exertion, the exhibitor succeeded in obtaining the concession of the cupriferous veins of the island, and a few borings were undertaken, which proved their existence in several places.

The principal vein is that of Santa Lucia, situated near the ruins of the old church, about three miles from Portoferraio, near the boundary of the serpentine; the ores are purple copper, copper pyrites, red oxide of copper, and a few fragments of native copper contained in a quartzose matrix. Samples taken near the outcrop yielded about  $6\frac{1}{2}$  per cent. of copper by assay.

This vein can be traced by various indications for a distance of about  $1\frac{1}{2}$  miles in a southerly direction. It is particularly apparent to the west of Monte Orello, where a block of native copper, weighing about 50 pounds, was accidentally found, but in a position giving no clue to its origin.

The three veins of Pomonte are situated at the western extremity of the island, and are continuously exposed in the face of the cliff for a length of about 20 yards. They vary in thickness from 8 inches to 5 feet, and contain numerous small strings of copper pyrites, which yield by assay 10 per cent. of metal.

The red copper ore of Volterraio is obtained from a deposit situate at a considerable height above the old castle of that name. It occurs in a slaty rock analogous to the *gabbro rosso* of Monte Catini.

In addition to the localities from which Sig. Foresi's specimens are obtained, copper ores have been found in a gangue or ochreous limonite and asbestos, at a point about 160 feet below the summit of Monte Perrone, near the village of Marciana, about  $2\frac{1}{2}$  miles from the nearest habitations.

The ancients, probably the Etruscans, were acquainted with the deposit, and they have removed all the ore lying near the surface by a series of shallow workings, so that it would be necessary to undertake a deep sinking in order to recover the lode.

W. P. JERVIS.

## ISLAND OF SARDINIA.

**59.—S. BELTRAMI, COUNT PIETRO,**  
(*Cagliari*).

Copper ores from the mines of Baritonis.

These are obtained from a vein in silurian slates, containing copper pyrites, with iron pyrites, blende, and galena. The workings lately undertaken appear to have been attended with favourable results.

## § 4. LEAD AND SILVER.

The lead mines of Italy are of a very important character; they are situated chiefly in Lombardy, Tuscany, and the island of Sardinia.

The production of the latter island was very small before the year 1848, but, in consequence of the liberal reforms introduced into the mining laws, and the cession of the government mines to private adventurers, the annual yield has been largely increased, the mines having yielded,

In 1851.....	1,300 tons of galena.
In 1860.....	13,000       "
In 1861.....	15,000       "

The whole of the above amount is exported, the greater part going to foreign countries, while the remainder is taken by the smelting works of Pertusola, in the Gulf of Spezia.

The island, however, possesses three smelting works, in which the old lead slags, already noticed, are heated. The first of these was established by Mr. Serpieri, and produced, in 1860, nearly 800 tons of lead.

This slag lead is richer in silver than the metal obtained from the galena of the mines now at work; it contains about 25 ounces to the ton. An establishment, for the purpose of distributing lead, by means of Pattinson's process, has been erected during the past year near Genoa.

Numerous veins of argentiferous galena are found in the Apuan Alps and the metalliferous chain; some of them appear to be very rich. Among those best worthy of the capitalists are the magnificent deposit of silver lead ore of Tambura, that of Terrinca, near Serravezza, and another at Val di Castello, not far from Pietrasanta.

The mine of Bottino, in the Val di Vezza, near Pietrasanta, in Tuscany, is remarkable for the large quantity of silver contained in the ore, which amounts to 4 or 5 per cent., or about 140 to 170 ounces per ton in the lead obtained. A complete dressing and smelting establishment is attached to the mine. Other mines deserving of notice are those of Castellaccia, in the Massetano, at Brusimpiano (Varese), and the recent discoveries of Chevalier Francfort, at Brovella and Motto Piombino, in the Val d'Agogna.

The production of the lead mines and smelting works of Italy is as follows:—

Galena exported, containing an average of 70 per cent. of lead and 5 to 6 oz. of silver per ton.....	} 10,000 tons
Lead .....	5,000   "
Silver.....	3       "
or nearly 96,000 ounces.	

## VAL SASSINA.

**60.—108. STREIFF AND Co., Ber-**  
*gamo.*

Lead ores from the mine of the Val Sassina.

## VAL D'AGOGNA.

**61.—2. AGOGNA AND BROVELLO**  
**MINING COMPANY, (*Società***  
*inglese delle miniere di) Pallanza.*

Argentiferous galena.

This company, which was formed in England, has, during the past year, undertaken an important series of explorations in the

upper valley of Agogna and Brovello, which have resulted in the discovery of the two following argentiferous galena veins.

1°. The vein of Brovello, situated in the district of that name. The sample of ore exhibited is taken from a level about ten fathoms below the bed of the torrent. The vein follows a N. and S. course through silurian slates. Thirty workmen are employed, under the direction of an English master-miner.

2°. The vein of Motto Piombino, in the districts of Nocco and Gignese, in the upper valley of Agogna, which is nearly ten feet wide, containing quartz and argentiferous galena; it occurs in the same silurian rocks, and the strike is also from N. to S.

The specimen exhibited fairly shows the nature of the ore produced.

About twenty men are employed on this lode.

The above mines have only just commenced to work away the ore, but the important discoveries that have been made in so short a space of time leads us to expect a great production at no very distant period. Their topographical position is extremely favourable.

The above are the only lead mines of importance in the province of Pellanza.

#### CENTRAL ITALY.

### 62.—12. BOTTINO MINING COMPANY (*Società del Bottino*), Lucca.

Rough ore.

Broken ore.

Rich ore, hand-picked.

Pure silver lead ore.

Silver lead ore, with blende, and copper pyrites.

Ore from the jiggings sieves.

Slime ores.

Slimes containing blende and pyrites.

The vein of Bottino is contained in the metamorphic paleozoic rocks, which are largely developed in the central part of the ellipsoid of the Apuan Alps; it has, however, been formed at a much more recent period, as it is related to the system of veins which are found breaking through the later rocks up to and including the eocene shales; it may be considered to be a veritable dyke of lead ore, the minerals occurring in a manner suggestive of injection or sublimation. The galena is associated with blende, copper pyrites, and sulphide of antimony; the latter mineral is often in the state of capillary crystals, and the others, associated with quartz, carbonate of lime, and a few rarer species, are often found in finely crystallized groups.

The present company are continuing the workings, which were commenced in 1829 by the re-opening of some very old mines. Mr. Blancard is the engineer in charge. The great extension of the operations during the latter years is due to a former director, Mr. Angelo Vegni, of Florence.

The extraction of the ore is easily effected in the ordinary way, and the work is sufficiently stable and resists the action of the atmosphere, so as to render the use of timber unnecessary in the shafts and levels.

About 2,500 to 3,000 tons of ore are annually extracted, all of which is treated on the spot.

The ore contains from 6 to 8 per cent. of lead, with an average of about 170 ounces of silver per ton. The greater part of the ores

are crushed between rollers or stamped, and are then subjected to washing processes, in order to concentrate them up to 30 per cent. The dressed ores are roasted in particular furnaces and smelted for lead in two low-blast furnaces. The silver is separated from the lead by cupellation. The annual production of the mines is as follows:—

Soft lead.....	48 tons
Antimonial, or hard lead 12 ..	
Litharge.....	27 "
Silver.....	28,940 ounces.

About 150 hands, including men, women, and children, are employed in the mines, dressing floors, and smelting works.

The local conditions are extremely favourable; the country is agreeable and picturesque, and the population intelligent and hard working. Good materials for making fire-bricks are found in the immediate vicinity. The important town of Seravezza is about  $\frac{3}{4}$  of a mile distant, the nearest railway station is  $2\frac{1}{2}$  miles, and the sea about 5 miles off.

### 63.—2103. HAHNER AND Co., Leghorn.

Argentiferous lead ore, from the mines of Val di Castello (Lucca) and Boccheggiano (Massa).

### 64.—60. JERVIS, W. P.

Galena, from a vein discovered at Fivizzano.

This sample was obtained from the outcrop of a vein which occurs in the slates of Verrucano, at a distance of about half a mile to the westward of Vinca, in the district of Fivizzano, at the juncture of the canals of Dolio and Ponticello; it was discovered by the exhibitor at the early part of the present year. The ore contains a large quantity of iron pyrites; the thickness of the vein is about a foot.

W. P. JERVIS.

### 65.—39. METALLO-TECHNICAL COMPANY (*Società metallo-technica*), Florence.

Ores from the mines of Poggio al Montone and Castellaccia, in the country of Massa.

Mining map of the district.

The mines of Poggio al Montone and Castellaccia belong to the above-named company; their representative in London is Count P. Guicciardini. The complete series of the ores and metallurgical products of this dis-

trict, furnished by the company, is exhibited by the Royal Museum of Florence.

The two deposits in question are situated in the metalliferous district of Massa. They form lodes of a banded or ribbed structure, coursing in an E. W. direction, through *alberese*, limestones, and slates of the eocene period.

The principal minerals are galena, blende, sulphurets of iron and copper, and quartz, which are arranged in a regular manner.

Castellaccia was in ancient times a centre of great mining activity. The system of working consisted in sinking a great number of vertical shafts to a small depth; many hundreds of these have been found along the back of the vein.

The present adventures have driven trial levels on several lodes, which are drained by an adit level; similar exploratory levels have been driven on the lodes of the other mine at Poggio al Montone.

The lead obtained contains from 15 to 17 oz. of silver to the ton. In addition to dressing floors, the company possess a complete establishment, in which the smelting and desilverizing of the ores is effected.

About one-half of the bulk of the ore raised consists of zinc blende, which is not used but is simply put aside. PROF. I. COCCHI.

#### ISLAND OF SARDINIA.

#### 66.—123. COSSU, PASQUALE, *Domus Novas*.

Galena from Acqua bona.

#### 67.—38. FERRO, FRANCESCO.

Galena from the mine of Reigraxius, Domus Novas (Cagliari).

Four samples of sulphide of lead (Reigraxius).

These are obtained from a deposit with a calcareous and barytic gangue, which occurs intercalated between the silurian slates and limestones.

The yield of ore in 1860 amounted to 159 tons of galena, accompanied by calcareo-argillaceous gangue, of a mean richness of 70 per cent. of lead.

#### 68.—45. GARRUCCIU, GIOVANNI MARIA, *Cagliari*.

Galena from the mine of Iscortis di Pubusinu, Iglesias (Cagliari).

#### 69.—47. GENNAMARI AND INGURTOSU MINING COMPANY (*Società delle miniere di*), *Ingurtosu, Iglesias (Cagliari)*.

Argentiferous galena from the Ingurtosu vein.

Merchantable ore, containing 79 to 80 per cent. of lead, and 8 ounces of silver to the ton, price £11 per ton.

Hand-picked ore, containing 82 per cent. of lead and 8 ounces of silver.

Hand-jigged ore, coarse grain, with 82 per cent. of lead and 8 ounces of silver.

Ditto, ditto, medium grain, 80 per cent. of lead and 8 ounces of silver.

Ditto, ditto, fine grain, 80 per cent. of lead and 8 ounces of silver.

Slime ores, 78 per cent. of lead and 8 ounces of silver.

Grey silurian slate.

Yellow ditto.

Ditto ditto fine grained.

Violet ditto ditto.

Granulite.

Black granite.

Quartz from the vein.

Wall of the vein.

Talcose quartz.

Ditto do., another quality.

Large-grained quartz rock

Quartz and yellow blende.

Galena blende and quartz.

Copper pyrites, carbonate of iron, galena, and quartz.

Galena and vitreous quartz

Ditto and copper pyrites.

Ditto pure coarse-grained.

Ditto pure fine-steel-grained.

This mine is situated on the prolongation of the mine of Montevecchio, and produces a similar kind of ore, but one containing less silver.

The yield of ore in 1861 amounted to 1,493 tons of galena, mixed with quartzose gangue matter, containing about 70 per cent. of lead and 8 ounces of silver.

In the years 1857 to 1860, the total produce amounted to 1,200 tons. The shipping place is close to the mine.

## GENNAMARI MINE.

Argentiferous galena from Gennamari.

Merchantable ore from the dressing floors, with 79 to 80 per cent. of lead and 14 ounces of silver.

Hand-dressed ore, with 22 per cent. of lead, and 14 ounces of silver.

Jigged ore, coarse grain, 80 per cent. of lead and 14 ounces of silver.

Ditto, fine grain, 79 to 80 per cent. of lead and 14 ounces of silver.

Washed ore, 78 per cent. of lead and 14 ounces of silver.

Grey silurian slate.

Ditto do., forming the roof of the vein.

Blackish grey talcose silurian slate, fine grained.

Violet silurian slate.

Specimen of the wall of the vein.

Veinstone, containing spots of pyrites and carbonate of iron.

Ditto, do. quartz, with a little galena and iron pyrites.

Ditto, do. quartz, with galena and copper pyrites.

Ditto, do. quartz and iron pyrites.

Ditto, do. quartz, slaty films, and talc.

Ditto, do. quartz, carbonate of iron, slate, and talc.

Ditto, do. quartz, pyrites, and carbonate of iron.

Ditto, with quartz, slaty fragments, and spots of galena.

Ditto, do. quartz, galena, and slate, cemented together.

Ditto, do. galena, quartz, and carbonate of iron.

Ditto, do. galena, slate, and carbonate of iron.

Samples of galena, with carbonate of iron.

Galena from the vein.

Ditto, with crystals of white lead ore.

This mine is also worked on the continuation of the Montevecchio vein, at a point where it is intersected by several cross courses. The produce in 1861 was 195 tons, and

from 1852 to 1861 about 11,000 tons, of a galena mixed with quartz-ore matter containing 78 per cent of lead, and about 14 ozs. of silver to the ton. C. PERAZZI.

## SAN GIORGIO.

70.—50. GOUIN, LEONE, and Co., *Iglesias (Cagliari)*.

Argentiferous galena, from the mine of San-Giorgio.

Commercial lead ore, 1st quality.

2nd quality.

Silurian limestone, in which the ore is found.

Hand-dressed ore, 1st quality, contains 81 per cent. of lead and 11 ozs. of silver to the ton. Price £9 12s. per ton.

Hand-dressed ore, 2nd quality, containing 64 per cent. of lead and 11 ozs. of silver to the ton. Price £9 2s. 6d. per ton.

Silurian limestone.

These products are obtained from workings recently opened on a deposit to the south of that of Monteponi, and of very similar character.

71.—57. HENFREY and FRANEL, *Turin*.

Argentiferous galena, from Montecour and Montezipiri (*Iglesias*).

These ores are from a new undertaking, which has, during the last few months, been yielding indications of great promise.

72.—135\*. LA FONTANA COMPANY, (*Società la Fontana*), *Domus Novas, (Cagliari)*.

Galena, from the mine of Monte Cervus, *Domus Novas*.

73.—67. MANNA, EMMANUELE, *Iglesias (Cagliari)*.

Galena, from San-Benedetto, (*Iglesias*).

74.—73. MASSONE, MARCELLO, *Cagliari*.

Lead ore, from the mine of Lula, district of Nuoro.

This is from a vein recently discovered in the silurian slates and limestones; the gangue is composed of heavy spar, with fluor spar, well interspersed nodules, and masses of galena.

C. PEUAZZI.

**75.—80. MONTEPONI MINING COMPANY, Cagliari, director Mr. P. A. Nicolai, Genoa.**

Galena, from the mine of Monteponi, Iglesias, Cagliari.

White lead ore, crystallized, from do. Anglesite, crystallized, from do.

Galena, from the mine of St. John.

These mines, which are the property of the state, have been leased to the company for a term of 30 years, from 1850, at an annual rent of £1,280.

The deposits consist of parallel flats or beds, intercalated among the silurian slates and limestones, which have been much broken up and re-arranged. The strike is from N. N. W. to S. S. E.

The workable is found concentrated in irregular columnar masses, which are occasionally of considerable size.

The galena is poor in silver, but is easily fusible. Numerous geodes of crystallized cerussite and anglesite are found accompanying it.

The production of ore during the year 1861 was 6,383 tons of mixed galena and calcareous gangue, containing 70 per cent. of lead and about 5 ozs. of silver to the ton.

For the ten years, 1851 to 1860, the produce was 21,968 tons.

The ores are shipped at the port of Carlo Forte.

**76.—73. MONTEVECCHIO MINING COMPANY, Cagliari, director Mr. Massone, Genoa.**

A block of pure argentiferous galena, from the mine of Montevecchio.

A veinstone, containing galena, mixed with the following minerals: quartz, slaty fragments, carbonate, and sulphate of lead.

This company, which was formed in 1848, holds three concessions, in all 3½ miles long. The course of the lode of Montevecchio has been traced for more than six miles in a N. E. and S. W. direction. The containing rocks are silurian slates. The gangue consists chiefly of quartz with occasionally a little blende and pyrites. The ore occurs very irregularly, appearing here and there in

columnar masses, which vary from 6 to 10 feet in thickness. The amount of silver varies between 12 and 60 ozs. to the ton.

An extensive dressing floor, with machinery driven by steam power, is attached to the mine.

The yield of ore during the year 1861 was 2,740 tons, containing 70 per cent. of lead and 16 to 18 ozs. of silver to the ton. The production of the preceding ten years, 1851 to 1860, amounted to 13,735 tons. The shipping port is at Cagliari.

**77.—142. NURCHIS, RAFFAELLO, Domus Novas.**

Galena, from Buoncammino, Domus Novas, Cagliari.

**78.—97. SADDI, SALVATORE, and Co., Cagliari.**

Galena, from the mine of Is-Arcelloni, near the village of Burcei (Cagliari).

Galena, from the mine of Su-Bacude, Is-Arrideli, Commune of San Veto (Cagliari).

**LEAD ORE, AND SLAG SMELTING WORKS.**

**79.—8. BELTRAMI, Count PIETRO, Cagliari.**

Old slags, from Ossida, Paddria, and Bosa.

Old slags, from the neighbourhood of Domus Novas.

Charcoal, from do.

Waste slags, from do.

Lead ore (galena), from Gennacarru.

**80.—42. FRANEL, EUGENIO, and Co., Turin.**

Samples of the ores smelted at the Pertusola works, in the Gulf of Spezia.

Series of intermediate products.

Silver lead, from ore smelting.

Refined lead desilverized.

These works were built in the year 1858, and have been in regular work since the end of 1860. The plant comprises three roasting furnaces, three blast furnaces, seven rever-

beratory melting furnaces, three blast furnaces, Castiglione pattern, one improving, one refining, and one litharge reducing furnace, twenty-one Pattinson's crystallizing pots, and a cupelling furnace. Two steam engines, of 15 horse-power, drive the blowing engines, pumps, and a lift for feeding the furnaces, in addition to working twelve jiggling sieves, which are employed in concentrating some of the poorer ores.

The works are connected with a wharf by means of a railway. Vessels of 300 to 400 tons can discharge alongside.

The fuel employed is a lignite, which is obtained from the neighbouring mine of Salzanello, in the Val di Magra, belonging to the same proprietors. It is of a very good quality, 8 cwt. being equal to 6 cwt. of the best anthracite.

**81.—72. MASSONI AND MUSANTI, Genoa.**

Lead refined by Pattinson's process, from the works of Sampierdarena.

**82.—74. MELIS, SALVATORE, Cagliari.**

Old slags, from smelting works up to the last century, near Villacidro.

Charcoal used in smelting.

Slag lead obtained from the above slags.

Slags from the same process.

**83.—104. SERPIERI AND BOUQUET COMPANY, Cagliari.**

Old slags from Domus Novas and Villamassargia.

Charcoal used in smelting.

Slag lead from old slags.

Poor slags from the second fusion.

A similar series of products obtained from the old slags of Flumini Maggiore.

	Lead per cent.	Silver.
Old slags from Domus Novas, containing . . . . .	13	
Ditto Flumini Maggiore, containing . . . . .	15	1-6th to
Ditto Villa Massargia, containing . . . . .	12	1-4th of an oz. per ton.
Ditto Grugua and Gessa, containing . . . . .	42	
Ditto Canonica, containing . . . . .	20	
Slag lead from Domus Novas slags, containing . . . . .	98	2½ oz.
Ditto, do., Flumini Maggiore, containing . . . . .	98	2 oz.

**§ 5. GOLD.**

About 3,200 ounces of gold are annually produced from the auriferous pyrites of the Alps and the gold quartz of the Ligurian Apennines; a further amount of about 800 ounces is obtained by working the sands brought down by some of the torrents in the Alps and Apennines.

The principal mines are those of Pestarena, in the valley of Anza, where the ore yields by amalgamation, about £6 per ton, giving an annual amount of about 1,900 ounces from 1,200 tons of pyrites; those of Val Toppa, where the ore is worth from £2 8s. to £3 4s. per ton; and those of Val Corsente, in the Apennines, working gold quartz of the value of 16s. to 20s. per ton.

**84.—145. PIRAZZI, MAFFIOLA AND Co., Predimultera.**

Gold ores, from the mines of Val Toppa (Ossola).

The various samples of ore exhibited represent the character and composition of the lode which is found in the same silurian slates as that of Pestarena, which has been mentioned above.

The ore is very quartzose, and although it contains less gold than that of Pestarena,

sheets of native metal visible to the naked eye are not unfrequently seen in the quartz. In the other localities the gold is never visible, but appears to occur in combination with pyrites.

The specimens exhibited are from two different veins:—

No. 1 yields 64s. per ton, at a cost of 32s. for extraction and 11s. for amalgamation.

No. 2 yields an average of 48s. per ton, at a cost of about 24s. for extraction.

One hundred amalgamating mills are employed, which are usually at work for 120 days during the year.

The annual production is estimated at 500 tons of ore, worth from £1,200 to £1,400.

The workmen employed include twelve miners, eleven millers, and six labourers.

C. PERAZZI.

## 85.—2095\*. SPEZIA, BROTHERS, *Turin*.

Samples of gold ores from the mines of Pestarena, in the valley of Anza (Ossola).

In ascending the valley of Anza, after passing the ridge of the Morghen, which divides the valley into two parts, the upper one being about 500 feet higher than the lower, we come upon the magnificent amphitheatre of Macugnana, crowned by the towering summits of Monte Rosa.

On reaching the Morghen we leave the gneiss, which is not again seen until after passing Pestarena; the intermediate portion of the valley, a distance of about two miles, is composed of micaceous and talcose slates, with strings and masses of quartz, belonging probably to the lower silurian period.

The stream of the Anza follows the general direction of the stratification of the rocks, from W. 30° S., to E. 30° N., and on the sides of the mountains bordering this part of the valley, the indications of a great number of veins are seen following a direction parallel to each other, from N.W. to S.E., and arranged in bunches of several veins each. Twenty-three of these veins have been worked at dif-

ferent times; the earlier adventurers mostly obtained large profits from them, but the greater number were abandoned after attaining a small depth, from the insufficiency of arrangements for draining the workings. The principal mines now at work are situated on the south side of the valley, where the shafts called Acquavite and Peschiera, which are provided with pumping and winding machinery, have been sunk to a depth of 76 yards and 184 yards respectively, from which the workings extend horizontally for more than three-quarters of a mile.

The thickness of the lodes is sometimes as much as three feet, containing a mixture of iron and sometimes arsenical pyrites, with strings of quartz and spots of galena. The amount of gold contained is very valuable, ranging from a few shillings to £80 and £100 per ton.

The specimen exhibited produced at the rate of £24 per ton.

About 1,300 tons of ores are annually raised from the above-mentioned shafts, which yields by amalgamation about £6 in value of gold per ton. About 200 workmen and 200 amalgamating mills are employed.

In order to drain the workings, Messrs. Spezia, Brothers, the principal proprietors of the works, have commenced driving an adit at the foot of Morghen, which will cut all the known veins at a depth of about 220 yards, in a distance of about 1½ miles. As, however, they are unable to continue it, for the want of sufficient funds, they are desirous of forming a company with sufficient capital to complete it.

## § 6. NICKEL.

Mr. Montefiore, of the firm of Bischoffsheim and Co., has recently succeeded in utilising the magnetic pyrites, containing about 5 per cent. of nickel, which is found in the Val di Sesia, and he has established a smelting works near Varallo, where the ore is converted in a concentrated speiss, containing 50 per cent. of nickel, in which state it is exported.

The quantity of nickel obtained in this manner, from the mines in the Val di Sesia, is about 50 tons annually, and in case of an increased demand arising for this metal, a further supply could be obtained from the numerous large deposits of magnetic pyrites, which are found in the hornblende rocks of the Alps.

## 86.—2097\* SCHOOL OF APPLIED ENGINEERING, *Turin*.

Block of magnetic pyrites, contain-

ing nickel, from the mine of Locarno (Varallo).

Speiss from the above, from La Bocca (Varallo).

## § 7. ANTIMONY.

The amount of antimony annually produced in Italy is rather more than 60 tons, the whole of which is obtained at the metallurgical works of Monte Argentario, near San Stefano, from the treatment of 100 tons of sulphide of antimony, from the mine of Monte Auto, in Tuscany.

The metal produced at these works is obtained by an entirely new process, devised by Professor E. Bechi, of Florence. It is extremely pure, and is consequently in great demand.

Antimony ores are also found in the islands of Sardinia and Elba, but in consequence of the limited demand for the metal they are not worked.

## CENTRAL ITALY.

**87.—2080. PATE, THOMAS, AND SON, Leghorn.**

Regulus of antimony from the works of San Stefano, smelted from Monte Auto ores.

The sulphuret of antimony of Monte Auto occurs in the form of a dyke, traversing the eocene rocks, and is accompanied by a quartz ore rock and carbonate of lime, which have been subsequently introduced by the percolation of the water of thermal springs through the interstices of the dyke.

A deposit of oxide of antimony, mixed with clay, is found near the surface, and is worked in an open cast excavation.

The yield of metal is between 35 per cent. and 80 per cent. of the weight of the ore, the total amount being 50 tons yearly, as already stated. It is exported to France, England, and America, where it is preferred to all other kinds, on account of its extreme purity.

Twelve persons are employed in the mines, working nine hours daily. On account of the

malaria, no work can be done during the four summer months.

## ISLAND OF SARDINIA.

**88.—38.\* FERRO, FRANCESCO, Cagliari.**

Sulphide of antimony is found in tolerably large quantities in the arrondissement of Lanusei, near Villasalto, where it was formerly worked, but the local difficulties combined with the small demand existing for the ore, caused the abandonment of the mine.

The ore was found in irregular lenticular masses interspersed through the silurian slates, which were very variable in extent, a circumstance rendering the mine very uncertain and irregular in production. **MARCHESE.**

## ISLAND OF ELBA.\*

**89.—130.\* FORESI, LUCIANO, Portoferraio.**

Antimony ore from Procchio, Elba.

## § 8. MERCURY.

Mercury ores were formerly produced to a considerable extent in Tuscany, from deposits containing cinnabar, at Ripa, Levigliani, and Iano; but the great reduction in the price of the metal that has latterly taken place, led to the abandonment of the mines.

The only place where they are worked at present is at Siele, where about 3½ tons of mercury are produced annually.

This mine is situated at about one hour's journey to the N. W. of Castellazara, in the district of Santa Fiora, in the small valley of the Siele.

The hill in which the deposit occurs is formed of thickly-bedded eocene limestones, alternating with argillaceous-calcareous shales, having a north-westerly strike. The limestone is penetrated by a number of small sparry veins, from 4 inches to 2 feet in thickness, through which the cinnabar is distributed.

In the second level of the mine, where the greatest extent of workings has been opened, no less than eight mercurial veins have been discovered, following a generally parallel course of a few degrees east of north. Two of these veins preserve their regularity for more than 100 yards.

The working of these mines appears to have been commenced in the 13th century; they were abandoned in the 15th century, when in the hands of the Dukes Cesarini Sforza, and were not re-opened till 1846, when they were purchased by a company in Leghorn, who shortly afterwards sold them to the present proprietors, Messrs. Cesare Sadun, of Sienna, and Angelo Rosselli, of Leghorn.

## VAL SASSINA.

**90.—29. CURIONI, GIULIO, Milan.**

Mercury ore, from the mine of Grasso.

A mine of cinnabar was formerly worked in the quartz rock of Margno, in the Val Sassina, where small strings of nearly pure ore, from 1 to 2½ inches in thickness, were found, but the great fall in the price of mercury caused the mine to be abandoned.

J. CURIONI.

## CENTRAL ITALY.

**91.—2103. HAHNER AND Co., Leghorn.**

Mercury ores from the mines of Ripa (Lucca).

**92.—98. SADUN AND Co., Sienna.**

Mercury ore from the mine of Siele, Santa Fiora (Grosseto).

## Mercury and vermilion.

### Plan of the workings of Sielo mine.

The following particulars have been obligingly furnished by the director of the mine, Professor Gaetano Burci.

The workings are chiefly concentrated on the left bank of the river, and are carried on at four different levels.

The veins have been almost entirely worked out in the three upper levels, and the bulk of the ore is now raised from the lower one; a fifth deeper level is about to be commenced.

The ground is worked away by underhand or overhand stoping, accordingly as one or other method is best suited to the particular spot. The ores are brought to the surface by a railway laid in one of the galleries.

The first sorting of the ore is effected in the mine; after it is brought to the surface it more carefully picked over and divided into two classes, the first containing from  $\frac{1}{2}$  to 1

per cent. of mercury, and the second less than  $\frac{1}{2}$  per cent.

The first-class ore is treated in two gallery furnaces, one of which has a single cast-iron retort, while in the other there are three.

The second quality is treated in a furnace which is continuous in its action, and is provided with condensing chambers arranged after the model of those in use at Idria.

The annual production amounts to about 69 cwt., but this is likely to be largely augmented as five new veins of cinnabar, one of which is 32 inches thick, have recently been discovered in the lower level.

The metal produced from these ores is in good demand, on account of its excellent quality; and it is readily sold at Leghorn. The manufacture of vermilion has been recently introduced and a specimen of this now produced is sent for exhibition.

About 60 men are attached to the works, and neither the furnace-men nor those employed underground appear to be at all affected by their employment.

## § 9. MANGANESE.

The mine of Saint Marcel, in the valley of Aosta, which is so famous for the rare mineral species it has produced, has been worked since the close of the last century, but without having yielded any large amount of ore.

A few other mines have lately been opened, the most considerable one being that of Framura, in Eastern Liguria. The total yield of all the Italian manganese mines does not exceed a thousand tons annually. A poor manganese ore, containing a large quantity of iron and a mixture of calcareous gangue, which is obtained in the mines of Eastern Liguria, has been recently employed by Mr. Ponsard as a flux for the Elba iron ores at the Follonica iron works. The pig iron obtained in this way contains a considerable quantity of manganese, and has been successfully employed for the manufacture of steel.

### EASTERN LIGURIA.

#### 93.—6. BARBA-TROYSE, GIUSEPPE, *Spezia (Genoa).*

Manganese ore from the mine of Rocchetta (Massa).

Iron and manganese ore from the same place.

#### 94.—33. DINI, PIETRO ANGELO, *Camajore (Lucca).*

Manganese ore from the mines of Camajore.

#### 95.—128.\* FEDERICI MARCO, *Arcola (Genoa).*

Manganese ores from the mine at Arcola (Spezia).

This mine was worked a few years ago,

and yielded a very good class of ore, but it has since been abandoned.

#### 96.—139.\* MAZZIOTTI AND Co., *Turin.*

Oxide of manganese from the mine of Framura (Spezia).

This is the most important manganese mine in Eastern Liguria, the production amounting to between 800 and 1,000 tons yearly. The ore is obtained from a thick deposit lying between slaty and jaspideous rocks, which are above the serpentine forming the mountains. The shipping place for the ores is in the immediate vicinity of the mine.

#### 97.—2089.\* ROCCHETTA (THE SYNDIC OF).

Oxide of manganese from the mountains of Rocchetta.

In the jasper rocks of the mountains of Rocchetta a number of rich deposits of good manganese ores are found. The produce is exported by the gulf of Spezia.

**98.—2096.\* TANCREDI, PIETRO,**  
*Trebbiano (Genoa).*

Manganese ores from Graziola and Guarcedi.

ISLAND OF SARDINIA.

**99.—S. BELTRAMI, Count PIETRO,**  
*Cagliari.*

Manganese ore from Bosa and Padria.

This ore, which is of good quality, is got from an irregular deposit, occurring to trachytic tuf. C. PERAZZI.

## SECTION III.

### SULPHUR.

The present production of the Italian sulphur mines is not less than 300,000 tons yearly, which, taken in the crude state, represents a money value of £1,200,000. It is estimated that the annual production in the year 1830 was only one-tenth of the present yield.

The greater part of the above quantity is derived from Sicily; the Romagna, however, is commencing to increase the supply, and at the present time contributes about 8,000 tons per annum.

An important improvement in the method of separating the sulphur from the accompanying limestone has been practised in Sicily for the last ten years.

The separation of the sulphur from the gangue is always effected by liquation, the necessary heat for the fusion being obtained by burning a portion of the ore; this operation, which was formerly effected in small cylindrical open kilns (*calcarelle*), is, by the improved process, performed in heaps which are often 400 times the capacity of the kilns. The ore is arranged in a manner similar to that employed for charcoal burning, the air being excluded by an impermeable covering of earth.

By the new process, the loss occasioned by the formation of sulphurous acid has been largely diminished, the production is increased by one-fifth, and the new heaps can be placed close to houses and gardens, instead of its being necessary to keep them several miles off, as was the case with the old system. Another advantage consists in being able to ignite the heaps at any time, doing away with the necessity of keeping large masses of ore in reserve for firing at a particular season of the year, and, lastly, it has converted a process formerly of the most deadly effect on the workmen employed into one almost entirely free from danger.

NORTHERN ITALY.

**100.—2077. ALBANI, Pesaro.**

Sulphur ore.

**101.—2100. FLORI, ALESSANDRO,**  
*Forli.*

Sulphur ore.

**102.—131.\* FORLI (SUB-COM-  
MITTEE).**

Sulphur.

**103.—94. ROMAGNA SULPHUR  
MINING COMPANY, Bologna.**

Crude sulphur melted from the ore.

Refined sulphur obtained from crude sulphur.

Sulphur in sticks.

Sublimed sulphur, flowers of sulphur for medicinal purposes.

The mines belonging to this company are eight in number, five of which are in the dis-

trict in the province of Forlì, Romagna, and three at Monte Feltre, in the province of Urbino and Pessaro, in the Marches.

The names of those in the first group of five are,

Firmignano.  
Luzzena.  
Fosso.  
Busca.  
Montemauro.

In the second group the mines are named,  
Perlicara.  
Marazzana.  
Montecchio.

The most important of these are the first one in the first group, and the first two in the second group.

The refined produce is exported chiefly from Rimini, where the refining establishment is situated, to the principal centres of consumption among the large towns of Italy, including Venice, Trieste, Ancona, and to Lombardy, Tuscany, Rome, &c.

Refined sulphur is used in various manufactories for making sulphuric acid, and, for several years past, a new use has been found for it in the sulphuration of vines.

The sample exhibited, which is in quality with the commercial article, is distinguished by its superior chemical qualities, which cause it to be preferred to Sicilian sulphur, and its perfect purity, resulting from the care with which the refining is performed.

The price of sulphur is constantly increasing. The following are the present prices, delivered either on board ship at the ports of Rimini and Cesenatico, or at the railway stations of Rimini and Cesena:—

Refined sulphur in lumps...	£ 8 10 6	per ton
" sticks...	10 3 6	"
	A. ZANOLINI.	

#### 104.—2091. SARAGONI AND TURCI, *Cesena (Forlì)*.

Sulphur of different qualities.

##### SOUTHERN ITALY.

Sulphur is found here and there at different places in the Neapolitan provinces, but not in any considerable amount.

In the volcanic country of the *solfatara* it is mixed with clay and other substances, from which it is separated by sublimation. The produce is very unimportant in amount.

Small scattered deposits are also found in Majella, the largest is that of Santa Liberata, near Lettomanopello, which belongs to Messrs. Leonelli, and yields a small annual profit.

The discovery of a sulphur-bearing deposit at Civitanova, in the province of Molise, has been recently announced to the Royal Insti-

tute for the Encouragement of the Useful Arts, but nothing more is known of it beyond the fact of the occurrence at the spot named of a limestone impregnated with sulphur, whose extent and value is as yet undetermined.

Sulphur has also been found at a place called San Regina, about two miles to the eastward of Ariano, but whether it is in workable quantity or not is at present unknown.

From the above evidence we are forced to conclude that no commercially valuable deposits of sulphur have as yet been discovered in the southern continental provinces.

O. COSTA.

##### ISLAND OF SICILY.

The gypsum and sulphur bearing formation of Sicily covers a large portion of the island, extending from Mount Etna to the neighbourhood of Trapani. The most important mines are principally situated in the provinces of Caltanissetta and Girgenti. The provinces of Catania and Palermo are next in importance, while the mines in the province of Trapani are the least productive.

The geological horizon of the gypsum beds is not yet satisfactorily determined; these have hitherto been supposed to be of mesozoic age, but more recent observers are inclined to assign them to a more recent period. In Sicily, as well as in the Romagna, the gypsum formation includes limestones, clays which are more or less marly, and beds of gypsum; in the latter rock, as well as in the limestones, the sulphur is found as an uniform or irregular mixture, sometimes concentrated in small parallel seams, and occasionally crystallized. In the latter case it is often associated with sulphate of strontia, or celestine.

In the clays and slates the sulphur occurs in a different manner, being found concentrated in globular masses; this method of occurrence is also observable in all the sulphur mines of the continent, which are contained in argillaceous strata.

The liqumtion is performed in the Calcaroni or open kilns already described; the loss of sulphur is estimated at one-third of the whole contents of the ore.

The greater part of the sulphur obtained is not refined in the island, but is exported in the crude state. For commercial purposes it is classified into three qualities, which are further divided into seven sub-classes, which are known as:—

- |              |                               |
|--------------|-------------------------------|
| 1st quality. |                               |
| 2nd quality, | { best,<br>good,<br>ordinary. |
| 3rd quality, | { best,<br>good,<br>ordinary. |

There are about fifty mines at present at work in Sicily, employing twenty thousand hands.

The production of 1861 is approximately estimated at 150,000 tons of commercial sulphur, of which about one-half was from the province of Caltanissetta, one-third from Girgenti, 25,000 tons from the province of Catania, and 20,000 tons from Palerino. The province of Trapani did not contribute more than a few hundred tons.

The principal shipping places are Girgenti, whence about half the total amount is exported, Licata, Catania, Palerino, Terranova, Siculiana, Palma, and Messina. About two-thirds of the quantity exported is taken by France and England, the remainder goes to Germany, Holland, the remaining countries of Europe, and the United States of America.

The price has increased very considerably during the last few years; in 1860 it varied between 12s. and 16s. per ton.

P. BIANCHI.

**105.—17. BURGARELLA,**  
AGOSTINO, *Trapani*.

Samples of sulphur.

**106.—28. COSTANZO SPINA,**  
ANTONIO, AND SON, GIOVANNI  
CALOGERO, *Catania*.

Sulphur-bearing marl from the solfataras of Destricella and Campana.

Crude and manufactured sulphur of 2nd and 3rd quality, from the solfataras of Cugio, Raddusa, Valguarnera, Petrapesce, and Zimbardo.

**107.—2079. FALLICA, ANDREA,**  
*Catania*.

Crystallized sulphur.

Crystallized celestine or sulphate of strontia.

**108.—134.\* GIUDICE, GASPAR,**  
*Girgenti*.

Sulphur-bearing rock.

Melted sulphur.

Sulphur moulded in sticks.

Flowers of sulphur.

**109.—90. PLATANIA, PAOLO,**  
AND CO., *Catania*.

Sulphur in powder.

Lump sulphur.

Sulphur melted naturally in the solfataras.

**110.—2093.\* SCOVAZZO-CAM-**  
MERATA, B. Rocco, *Catania*.

Manufactured sulphur from the solfataras of Tintura.

**111.—106. SISTO, B. ANTONINO,**  
*Catania*.

Sulphur in lumps, from Muglia, near Catania.

*Refineries.*

**112.—120.\* BARBAGALLO, SAL-**  
VATORE, *Catania*.

Sublimed sulphur.

**113.—136\*. LICCIARDELLO, SAL-**  
VATORE, *Catania*.

Sulphur prepared for the sulphuration of vines.

## SECTION IV.

### MINERAL FUELS.

Although rocks of the carboniferous period are found in Italy, they do not contain the valuable deposits of coal by which they are distinguished in other countries. The only mineral fuels worked in the Peninsula are anthracite and lignites.

The anthracite beds of the valley of Aosta are of considerable extent, but,

on account of the large quantity of ash they contain, they are in limited demand, and the total amount raised does not exceed 1,000 tons yearly.

Another small patch of coal, apparently of carboniferous age, is found at Seni, in the centre of Sardinia, but the inaccessible nature of the locality from the absence of roads, has prevented its being worked.

Lignites are tolerably abundant in the miocene tertiary rocks, and, as they are often of an excellent quality, and occur in deposits of great thickness, they have given rise to a few considerable mining enterprises.

Of later date than the miocene deposits, are the post-pliocene, peaty lignites of Lefie and Cerete, in Bergamo. These are old peat bogs which have been covered up by subsequent lacustrine deposits, and remains of pachydermatous animals are occasionally found in them. This lignite has been worked at Lefie since the commencement of the present century, and about 250,000 tons have been extracted for the use of the neighbouring silk spinning establishments.

The combined produce of the mines of Salzanello, Cadibona, Monte Bamboli, Tatti, and Calabria, without taking into account the less important ore, such as Giffoni, Gonnese, Sogliano, Nuceto, and a few other trial workings, is about 60,000 tons of lignite annually.

A great number of deposits of lignite are known in the Neapolitan provinces, but they are all of minor importance, both as regards quality and extension.

A compact lignite of a resinous lustre (Jayet) is found in fragments disseminated through a smectic clay, confusedly stratified in the mountains of Tirriolo, in Calabria Ulterior II.

Nodular masses of a similar character are found in the various deposits of lignite, of good quality, which have been discovered on the banks of the river Tordino, in the valley of S. John, Teramo.

The same quality of combustible is also found, but more abundantly, forming part of the thick beds of lignite at Gonidoni.

The lignite of Castelbelmonte, in the province of Aquila, is of a good quality, although inferior to that last mentioned.

Other deposits of a low quality have been discovered at the foot of the Majella, as well as at Lettomanoppello, Roccamorice, and other places in the same country.

A superior quality is found at Guardiagrele, Pennapiedimonte, Gessopalena, Roccascalegna, and elsewhere, in the province of Chieti. The lignite of these districts is a true *zoophythantrace*, or coal, whose origin is due to zoophytes, a structure that was first established by Mr. Tondi.

Samples of good lignite have from time to time been obtained from Gerace, Squillace, Zaccarise, and Teramo; an excellent quality is also found at Catanzaro.

A small deposit of lignite has been found at Rionero, in the county of Molise, but it is of too insignificant an extent to be of much value.

In the same province, near Baranello, an excellent quality of lignite is found in argillaceous-micaceous shales. The lignite existing at Saint Fremonte is of such a good quality, that it was described as coal, in 1827, by Mr. Covelli.

Peat is found in the north of Italy in quantities sufficient to supply the industrial wants of the country for a long period to come. Most of the turbaries are nearly untouched, the workings having been confined to trial borings, or small irregular excavations; there are, however, a few which are worked systematically on a large scale.

Next in order to the fossil fuels must be placed the liquid bituminous substances which are found both in central and southern Italy, and the rocks in which similar materials are found in the solid state.

A deposit of bitumen of no very great importance, of an enigmatical origin, is found in the district of Saint Elia, between Caramanico and Saint Valentine, in Abruzzo Citeriore, at a depth of from three to five feet below the surface.

A similar substance is seen near Roccamorice, and in the same neighbourhood traces of other deposits are found, if indeed they be not part of one extended mass, which is hidden in places by overlying earthy masses.

The proprietor of the last-mentioned deposit is Mr. Leonelli, and it is from here that all the asphalt required for the government engineering works is supplied.

The same mineral reappears further on, at Pignataro, where it is worked by Guglielmi and Co.

A fine spring of asphalt is found at Puglietta, about two miles from the plain of Eboli, on an estate belonging to the Benedictine monks of Camaldoli. The opening is on the eastern slope of a hill, and, at a considerable distance below it, a series of springs, containing sulphurous acid and sulphurated hydrogen, rise to the surface.

Asphalt is also found in considerable quantities in the lower parts of Morrone, near Tecco, where it exudes from between the beds of the rocks and flows into the brooks, discharging in the Arollo river.

The annual production of fossil fuel in Italy, putting aside bitumen and similar substances, may be estimated as follows:—

Anthracite . . . . .	1,000 tons.
Lignite . . . . .	60,000 „
Lignite of a peaty character . . . . .	15,000 „
Peat or turf . . . . .	50,000 „

### 1. Graphite.

Although not represented at the Exhibition, we must not forget to include graphite in our sketch of the economic minerals of Italy. The principal mines producing this substance are those of Pignerol and Miggiandone, in the valley of Toce, and that of Olivadi, in Calabria Ulterior II. The ordinary amount produced by the mines of Piedmont is yet limited to 300 tons yearly, but this could be largely increased if a better demand existed for the article. The mine at Olivadi, which was reopened about 40 years since, has been abandoned for a second time. From the abundance and good quality of the ore which this mine contains, it might be reasonably expected to prove a flourishing enterprise if the workings were resumed under the charge of able and experienced persons.

O. COSTA.

### 2. Anthracite.

#### 114.—46. GAVIANO, AGOSTINO, Lanusei (Cagliari).

Anthracite, from Saint Sebastian, Lecis.

### 3. Lignites.

#### 115.—8. BELTRAMI, Count PIERO, Cagliari (Sardinia).

Lignite, from Bannabis, Gonessa.

#### 116.—122\*. COJOLI, ENRICO, Leghorn.

Lignite, from the mine of Podernovo, Valley of Cecina.

In this mine two beds are worked; they are about 4 feet thick, and are separated from each other by about a foot of a marly clay parting, containing planorbis, paludineæ, and other fresh water forms. A similar marly bed forms the floor of the lower seam, while the roof of the upper bed is a shelly rock of marine origin, known as panchina, which belongs to the upper miocene strata.

The outcrop of the beds has been traced for several miles; the average dip is about four degrees, and the continuity of the deposit has been proved by trial sinkings and levels at different points.

There are no difficulties attending either the working or extraction of the coal. The mine is about 17 miles from the sea, and nine

from the Maremmana railway, with which it could easily be united by a good road.

**117.—2037.\* SCHOOL OF APPLIED ENGINEERING, (*Scuola di applicazione degl' Ingegneri*), Turin.**

Lignite from the mine of Cadibona, Savona. Plans and sections of the workings.

The importance of this mine will be seen by an inspection of the plans and sections exhibited; the produce, however, has fallen off, the yield for the last year being at the rate of 3,000 tons monthly.

**118.—131.\* FORLI, SUB-COMMITTEE.**

Lignites.

**119.—42. FRANEL AND Co., Turin.**

Lignite from the mine of Salzanello (Magra).

The production of this mine has hitherto been at the rate of 1,000 tons per month, but this will soon be augmented to 2,500 tons, in consequence of erection of a new and powerful steam winding-engine.

The thickness of the seam varies between 5 and 10 feet; it is interstratified between the clays and slates of the miocene period, in the lower valley of the Magra.

About 200 men are employed in the mine. It is from this mine that the fuel employed in the lead smelting works, belonging to the same proprietors, is derived. (See No. 80.)

**120.—2102. GINORI-LISCI (Marquis), Florence.**

Lignite from Querceto, near Volterra.

Iron ores (magnetite).

**121.—62. MACERATA, SUB-COMMITTEE.**

Samples of lignite from the outcrop of the seams.

**122.—92. QUARTAPELLE, RAFAELO, Teramo.**

Lignite.

**123.—2083.\* RACCHI, Dr. GIUSEPPE, Benevento.**

Lignite from the territory of Casaluni.

Ditto ditto Vagliara.

**124.—110. TIMON, Cav. ANTONIO. Cagliari.**

Lignite from the mine of Terras de Collu, near the village of Gonnesa, province of Iglesias.

**4. Peat and Turf.**

**125.—10. BIRAGHI AND Co., Milan.**

Peaty lignite from Lefte, in the valley of Gandino, Bergamo.

The house of Biraghi and Company exhibits samples of the peaty lignite which is mined at Lefte, in the valley of Gandino, in the province of Bergamo. The basin in which this fuel is found extends through nearly the whole of the valley. The deposit is of considerable thickness, but owing to the loose and watery character of the overlying sand and clays, a considerable portion is lost, as it is necessary to leave about a yard of the seam untouched, both above and below the galleries, in order to form a solid roof and floor for the workings.

The mine was opened in the year 1804, and is still worked by Messrs. Biraghi and Botta.

The annual produce amounts to about 10,000 tons, estimated in a dry state; when freshly raised this fuel contains 33 per cent. of water. The deposit has been proved, by the remains of pachydermata found in it, to be of post-pliocene age.

**126.—19. CALZA-CRAMER, GIOVANNI, Grugliasco (Turin).**

Dried blocks of turf.

**127.—43. GABRIELE, ANTONIO, San Bartolomeo-in-Galdo (Benevento).**

Peat, from Caparelli.

**128.—149\*. ORRIGONI, ANGELO, Varese (Como).**

Peat from the turbary situate near the lake of Varese.

Mr. A. Orrigoni exhibits the above specimens of peat, which is taken from that portion of the extensive turbary of Varano on the shores of the lake of Varese, which belongs to Count Giulio Litta. The thickness of this mass of peat is nowhere less than six feet, and often so much greater that the bottom has not been reached in some of the ordinary borings. The average amount of ash does not exceed 6 per cent. This deposit has been worked to a considerable extent during the last few years.

**129.—146\*. PIROLI, Professor  
ANDREA, Parma.**

Various samples of peaty lignite.

The deposit from which these samples have been obtained, is a thin bed contained in the upper marine tertiary strata. A few trial workings were commenced on it a short time since.

*5. Bitumen.*

**130.—41. FORNOVO, LOCAL EXHIBITORS' COMMITTEE, Parma.**

Yellow petroleum, from Neviano de Rossi.

**131.—141\*. NOCITO, GAETANO, Girgenti.**

Bituminous shale, from the neighbourhood of Girgenti.

**132. — 143\*. PAPARELLA, GIUSEPPE, Joco (Chieti).**

Petroleum.

**133.—111. TOVAZZI, CESARE, Fornaro (Parma).**

Petroleum, white.

„ straw coloured.  
„ black.

## SECTION V.

### STONE AND MARBLE QUARRIES.

The articles included in this section of our survey are of a very important character, as they contribute an important item to the exports of the country, in addition to furnishing the raw material supplying several local industries, upon which the well being of the people is closely dependent. They are used for building purposes as well as for works of sculpture and the manufacture of a host of articles of utility or luxury; and in former times they have furnished the materials from which have been fashioned the great relics of Etruscan, Greek, and Roman art, as well as others of later times that have reached down to our days, and shed a lustre over the towns of Italy, the reflection of a by-gone glory which can never be forgotten. In the following pages a general description of the various Marbles and other stones will be found, commencing with the general collections, and followed by the more special ones. The introductory descriptive matter is principally furnished by Mr. Igino Cocchi, Professor of Mineralogy and Geology in the Royal Museum of Natural History at Florence.

**134.--39. FLORENCE NATURAL HISTORY MUSEUM (GEOLOGICAL DEPARTMENT).**

Collection of marbles, building-stones, &c.

#### § 1.—MARBLES.

The name of marble is restricted to certain limestones of a crystalline or granular structure which are sufficiently compact to be susceptible of taking a high polish.

As examples of the crystalline or saccharoidal structure, we make take the white marbles of the Apuan Alps (Lunigiana, Carrara, Massa, Seravezza, &c.), the "Bardigli" of the same localities, those of Valdieri in Piedmont, and certain of the marbles of Venetia, Trentino, and the province of Brescia.

If the crystallization is of a very decided character, the structure becomes lamellar, as in the white marble of Pallanza, the Bardigli, and statuary marbles of Monte Rombolo, Monte Calvi (Campiglia), and the island of Elba, which are in every respect equal to the famous marbles of Paros.

The granular structure is seen in the white marbles of the *Monte Pisano*, the yellow of Sienna, or *giollo di Siena*, and the majority of the marbles exhibited by the Neapolitan and northern provinces.

The black marbles of Spezia, Brescia, &c., certain varieties of *alberese*, and the fine slabs from Perugia, exhibited by Count Orini, furnish examples of compact limestones of a very fine grained structure.

These limestones mark the limit dividing the ornamental marbles from those that are only fitted for building purposes. The price of the former is more or less considerable, according to their varying capacity for taking and retaining a fine polish, like that of black marble, a quality which is not possessed by any other rock of the same colour.

The breccias, or brecciated marbles, are formed of fragments of limestones united by a more or less calcareous cement, or they may contain fragments of different rocks set in a calcareous base. They are found in great variety, many of them being extremely beautiful, as, for instance, the brilliantly-coloured breccia of Terra di Lavoro, the superb *affricano* of Seravezza, that of Rondone (Seravezza), that of Finocchioso (Carrara), the *Mischi* or mixed marbles of Seravezza and Massa, and the *Mandorlato* and *affricano* of Vicentin.

The breccias command a very high price, on account of the vivacity of their tints and the delicacy and harmony of their variegations and shading; in addition to which they are extremely durable, from the hardness of the fragments, and the homogeneous nature of the cementing material.

In a commercial classification the breccias form the class of variegated or spotted marbles, and it is under that head that they will be noticed. The marbles, properly so called, fall into the two principal divisions of white and coloured marbles.

#### WHITE MARBLES.

This is the most important class, on account of the extensive commerce of which it is the object. There are three commercial divisions, the first of which is exclusively employed for fine sculpture, and is distinguished as statuary marble; the second is also used for sculpture and the higher class of architectural ornamentation; it includes the clear white marbles, *marmo bianco chiaro*, and the common white quality; the third includes all the other varieties, which are often excellent, but are generally inferior to the foregoing, either in tint or structure, or are veined or spotted; they are used for making chimney-pieces, tables, paper weights, &c., and may be called furniture marbles.

These three classes are susceptible of further sub-division, according to well-known types, around which all the varieties and sub-varieties known in commerce may be arranged.

#### STATUARY MARBLES.

These are the most beautiful of the white marbles, and it will be convenient to divide them into statuary marbles proper, and those of lamellar structure, having for type the marble of Paros. The most valuable varieties are those of a fine white colour, having a slightly bluish tint, having a certain amount of transparency, and a perfectly homogeneous lamellar structure, so that the unequal reflection from different sized lamellæ shall not produce a disagreeable effect. The *Venere dei Medici* and the Farnese Vase are examples of the use of the very highest class of material. The varieties uniting all the above characters are of a very high price; among them, are the marbles of the Island of Elba, of Campiglia, and more especially those of Monte Rombolo, which are in nowise inferior to their Greek type.

The friability of some kinds of marbles, analogous to that of several kinds of dolomites, is a consequence of their lamellar structure, a fact that should make the artist hesitate in choosing blocks of this character, as they offer but little resistance to the chisel, and are too fragile to be used for ornaments and cornices.

The statuary marbles proper are divided into several qualities; those of the first quality are exclusively obtained from the Apuan Alps, and may be referred to four types, which are as follows:—

1st. The statuary marble of Monte Altissimo, superior to all others, and universally pre-

ferred by sculptors, is the dearest. Of this class are the marbles of Girardino, those of Tambura, and Arni, the large specimen exhibited with the breccias of Massa, and a few others.

2nd. Yellowish statuary marble of Carrara or (*giallognolo*), which is principally obtained from Cressola.

3rd. Bluish (*statuario ceruleo*) marble, having for type that of Poggio Silvestro, near Carrara.

4th. Snow white (*bianco niveo*) marble, which is represented by that of Monte-Corchia. The extreme whiteness of this variety is considered objectionable by sculptors, as rendering it unfit to reproduce the effect of flesh; and a defective quality of the grain to which it is subject renders it of inferior value to the preceding varieties.

The presence, or complete absence of spots or veins, and the greater or less homogeneity of the mass, are the essential elements which determine the price of statuary marbles.

After the first class come the statuary marbles of the second class. This term is generally applied to all marbles of a defective structure.

Some of these may be grouped around well-defined types, such as the second quality of Monte Altissimo, and those of Massa and Seravezza.

The marble of Betogli, among the specimens from Carrara, forms another type belonging to this group, of which the principal characteristic is the feeble cohesion of its particles, and consequently slight durability. It has, nevertheless, rather a fine appearance, and as it is easily worked it commands a ready sale. This class of marbles, which are known to artists as *saloni*, should be avoided as much as possible for all works of sculpture. The well-known flexible marble of Carrara approach very nearly to this type.

The varieties included in this division are very numerous, and with the exception of the *saloni*, all, or nearly all of them, are suited for the sculptor's use. Many of these varieties are admirably adapted for large monuments, especially for such as are intended to stand atmospheric exposure, which rapidly alters the delicate grain of first-class marbles; many, however, are less suited for exposure, and the artist should be careful to avoid using them for such a purpose.

The most esteemed varieties of this class are the marbles of La Polla, in Monte Altissimo, which are of a very close grain, and hard to the chisel, and resist perfectly shock and pressure, and the variable action of the atmosphere. Many of the marbles of Massa are of a similar character.

The varieties of clear white marble extracted from the quarries of Massa, Carrara, and Seravezza are extremely numerous, they are all of a more or less adapted for the various purposes mentioned above, when properly chosen.

The series of *Ravaccioni*, so called from the marble of Ravaccione of Carrara, belongs to a transition group leading to the third class, which is represented by the marbles of Trambiserra, Cossa, Monte Altissimo, Monte Corchia, Massa, Carrara, and Lunigiana.

#### VEINED WHITE MARBLES.

Under this category are included a series of white marbles, more or less translucent and crystalline, which are traversed by parallel sinuous or reticulated veins of colour, or which are more or less irregularly spotted.

These marbles are not fitted for sculpture; they can be used for certain architectural purposes, but their chief use is for certain decorative objects, such as balustrades, table-tops, and chimney pieces. They form a series parallel to the preceding one; and the prices vary according to the whiteness, transparency, and granular structure of the mass. Those possessing these qualities in the highest degree are the *tigrato* of Altavana (Massa), that of Monte Corchia, the veined statuary (*statuario venato*), of the same locality, the splashed or spotted (*statuario macchiato*) marble of Massa, and many of the marbles of Carrara, which are very fine, although they are veined and spotted.

In addition to the numerous samples of these different marbles, the block of bust size from Monte Altissimo, and the objects exhibited by Messrs. Guerra, are deserving of special examination. A visit to the sculpture gallery will also be very useful in order to appreciate exactly the nature and properties of the marbles which have just been described.

#### WHITE GRANULAR MARBLES.

These marbles are not nearly so important commercially as the crystalline varieties. In these the metamorphic action has not been sufficiently energetic to destroy the last traces of organic matter, and the original stratification of the rock; and the crystallizing force has not been sufficiently exercised to allow of the entire rearrangement of the whole of the molecules so as to expel the included impurities.

They are, thereby, impaired by more or less grave defects; their hardness, solidity, resistance, and impenetrability being greatly inferior to those of the more perfect marbles already described.

From the absence of better marbles, and their extremely low price, they are extensively employed in the localities adjacent to the places where they are quarried. The varieties most in repute are those of the Pisan mountains, Trentino, Vicentin, and the environs of Ascoli. The collection from the Pisan mountains contains some fossiliferous specimens, although they are of the same age as the most perfectly crystalline statuary marble.

#### COLOURED MARBLES.

Under this head are included all marbles of a more or less uniform colour, or which are veined, splashed, or spotted equally upon a uniformly coloured base.

Among these marbles, which are very numerous, the following are the most important:—

1. Black marbles, with a uniform or clouded base, or veined with white or yellow.
2. Bardigli.
3. Red marbles of a uniform or clouded tint.
4. Yellow and violet marbles (*broccatelli*).
5. Reddish marbles (*ceciato unito*) or variously veined, which are specially obtained from the *alberese*.
6. Certain varieties of a greenish colour (*verdognolo*).
7. Among the coloured marbles are also included certain breccias, in which the uniform tint of the base is broken by small fragments, or pebbles of limestone of different colours, which were introduced into the mass during the formation of the sedimentary deposit.

#### BLACK MARBLES.

The finest black marbles with which we are at present acquainted in Italy are those of Caserta Vecchia (Terra di Lavoro), the Pisan mountains, Carrara and Spezia, in the metalliferous chain, and that of the province of Brescia.

The analogy existing between the black marbles of the two latter localities is probably due to an important geological fact. They are for the most part streaked with small white sparry veins, which, by reason of their constitution, traverse the marble in regular lines like small lodes. These white veins are often replaced by smaller yellow ones, as in the celebrated marble of *Portoro* or *Portovenere*, very fine specimens of which are to be found in the collection from Spezia. The most beautiful variety is that in which interlacing veins of a golden yellow colour are set into a uniform black ground.

It must be remarked that the grain of this marble is such that it will not keep its polish without extreme care.

#### BARDIGLI.

The numerous series of the bardigli comes next in order; it contains many very precious marbles, the rarest of which is the turquoise blue variety (*bardiglio turchino unito*); the finest specimens are from Monte della Cappella, near Seravezza, some of which are exhibited by Messrs. Garfagnini, Brothers.

The veined bardiglio (*bardiglio venato*) is due to an incipient discolouration of the black marble, which changes the primitive colour into a vague tint, which is much sought after. If the discolouration is only partially extended through the mass, the product is known as flowered bardiglio (*bardiglio fiorito*); when it is carried to its extreme limit we obtain white marble, which, when seen in places or in selected specimens, show the transition from its original to its present condition. The flowered bardiglio is one of the richest marbles that we possess. The finest specimens are obtained entirely from the quarries to the eastward of Seravezza. The small table exhibited by Mr. G. G. Arata, of Seravezza, is a sample from his quarry of Pisciarotte; and another magnificent slab, exhibited by Mr. G. Galligani, from Mr. Sancholles Henreaux's quarry, at Pelignano, will give a good idea of the beauty of these marbles.

Other equally precious varieties are the veined bardigli of Valdieri, in Piedmont, those of Recoaro, Oliero, and Arsiero, in the province of Venice, as well as those of Campiglia, Monte Rombolo, and the island of Elba, in Tuscany, which furnish us with a new example of marbles of lamellar structure.

## RED MARBLES.

The ammonite limestone, which forms a well-marked geological horizon throughout the whole of the metalliferous chain of Tuscany, by its regular stratification and its characteristic fossils, is generally of a more or less bright red colour, which is usually very agreeable to the eye. It is quarried in several places.

In spite of its compact character, however, it scales off very readily, and is friable, vitreous, and full of cleavage planes; in addition to which it is usually only found in thin beds, which prevents it being used for other than table tops and flooring slabs. It is very rarely found of a fine uniform red colour; when it is so it is usually less defective, and sells at a higher price. The ordinary specimens are of a light red colour, with ocellated marking (*occhiato*), and of a brecciated structure. The specimens of this marble are exhibited in the collections from Spezia, Seravezza, Campiglia, and Camajore. In the Central Apennines the middle lias is represented by a red limestone, analogous to the preceding one, and which can be used for similar purposes, as may be seen in the collection from Ascoli. The upper lias also contains a red marble in some of the provinces.

All the red Italian marbles are obtained from one or other of these liassic formations.

## YELLOW MARBLES.

By a peculiar alteration of its colour and structure, the red ammonite marble is changed into a yellow granular form, in the brocatellos and yellow breccias. The valley of Santa Maria del Giudice, in the mountains of Pisa, the mountains of Carrara, the *Montagnola Senese*, and many of the southern provinces, produce marbles of this kind, which are more or less in demand.

The most famous are the marbles of Sienna, represented by fine specimens from the estate of Cerbaie, belonging to Count B. Tolomei, and from the estate of Reniere, belonging to Mr. G. Nomis. The marbles from the last-named property have not as yet been quarried for sale, but the great beauty of its clear yellow colour, and the large size of which the blocks can be obtained, together with the fine quality of the statuary marble already worked at the same place, make these quarries peculiarly interesting in an industrial point of view.

The three remaining classes of coloured marbles are of an inferior importance. The fine alabs exhibited by Count Orfini, of Fuligno, are good examples of the reddish yellow limestones (*ceciato*) of close grained and uniform texture, which occur in the alberese. The peculiar and delicate colour of this rock renders it very suitable for ornamental purposes. The quarry belonging to Count Orfini is capable of furnishing a large supply, but up to the present time it has only been employed in the immediate vicinity, where there is no great demand for it.

A few specimens of inferior green marbles are to be seen in the collection from Carrara.

In the collection from Ascoli will be seen a breccia belonging to the neocomian system; this is a red limestone, with white spots, which are produced by an intermixture of white calcareous pebbles.

## VARIEGATED MARBLES (VARIEGATI).

The most beautiful among the breccias known to us in Italy are those of Terra di Lavoro, but they are not quarried for sale; some of the alpine varieties are extremely valuable; that of Coregna, near La Spezia, is very beautiful, but its excessive hardness necessarily prevents it from being very largely used. The mountains extending from Carrara to Seravezza are also remarkable for the excellence of their produce in this particular class, as will be seen by an examination of the breccias and *micchi* of Seravezza, Massa, and Carrara. The light and dark coloured mixed marbles (*micchi*), the breccias known as *africano*, the breccias of Rondone, and other localities, the *Persichino* of Corchia, and Vallata di Renaia, and the *paonazzi* of Laghetto, Finocchioso, Cava di Sponda, Boccanaglia, &c., are all very brilliant and costly marbles.

## BRECCIAS.

The breccias of the metalliferous chain are formed of fragments of highly crystalline limestone, united together by a siliceo-calcareous cement, containing an admixture of a hornblende substance, which is eminently hard and resistant to the action of the atmosphere. The cement is due to a particular action of the adjacent masses or veins of iron ore, which are found in contact with the rocks in question. The hornblende cement, with its iron or man-

ganese base, produces the variegated appearance resembling the colours of the peacock's tail, and rose colour, peach blossom, and other delicate tints, which may be seen in the specimens from the different localities.

As may be imagined from their composition, these rocks are, as a rule, extremely inalterable by ordinary atmospheric agencies. Examples of this fact are furnished by the *mischi* and *africano* of Seravezza, employed in some of the principal monuments of Florence.

The great column which formerly stood in the square of San Felice, but which has been lying on the ground for many years, exposed to the action of atmospheric water, has in nowise been injured by such unfavourable treatment. The tenacity with which the *Porto Santo*, the *Africano*, the *Brillante*, the *Paonazzo* and other varieties retain their polish is another valuable quality, which renders them eminently adapted for the more costly class of decorative works.

The whole of the Italian calcareous formations, of all ages, furnish a supply of excellent marbles from the miocene lumachella, down to the upper triassic and muschelkalk lime-stones, and perhaps those of an older period.

### REMARKS ON THE MARBLE TRADE OF ITALY.

The best known and most esteemed marbles are, as has already been seen, principally obtained from Tuscany.

The white marbles of saccharoidal structure are those which are now principally preferred by sculptors. The most perfect blocks that could possibly be obtained are those of lamellar structure, derived from the quarries of Campigliese and the island of Elba. As regards saccharoid marbles, they are exclusively obtained from the Apuan Alps, and more especially from the wild mountains which rise above Carrara, Massa, and Seravezza. Large quantities of marble were obtained in the time of the Romans, from the mountains of Lunigiana (*Montes Lunenses*); and the name of Carrara statuary marbles is known all over the world. Leo X., Cosmo I., and Francis I., of Medicis, devoted much of their time and attention to the working of the marbles of Seravezza, the excellent quality of which was demonstrated by Michael Angelo, as well as the difficulty of obtaining them "until the mountains were lowered and the inhabitants tamed," two processes which have never been fairly accomplished until a very recent period. The extraction of the marbles of Seravezza has been re-established on a large scale, Russia alone having taken them to the amount of one million roubles (about £150,000) for the construction of the cathedral of Saint Isaac, at St. Petersburg; and the population of the district of Pietrasanta has increased in 30 years (from 1819 to 1850), from 15,495 to 23,200 inhabitants, or nearly 50 per cent.

In addition to rough blocks, Seravezza exports a considerable quantity of table-tops, flooring-slabs, and other sawn products. The trade of Carrara has recently increased to a considerable extent, owing chiefly to the efforts of the Local Academy of Fine Arts. In like manner the trade of Massa has increased in a manner that leads us to expect a still further expansion, for a great number of its marbles are of a character resembling the statuary marble of Monte Altissimo, and their architectural qualities are in every way equal to those of Seravezza, both as regards uniformity and durability, and they are equally well adapted to the most delicate kinds of sculpture. A marble, analogous to that of La Polla, already described, and comparable to the statuary quality of Crestola, is found in large quantities in the romantic and picturesque ravine of Equi, in the Lunigiana.

The greatest possible care is necessary in the selection of marbles for exportation. The opinion current in Paris, that the marbles of Carrara are unable to withstand the effects of the climate of that city, is due to the frequent use of *Saloni* and *Ravaccioni* of a bad quality, the slightly coherent marble of Betogli, and other inferior descriptions from the Carrara country.

The Montagnola of Sienna furnish *broccatelli* and yellow marbles. If the quarries belonging to Mr. Nonis were opened and properly worked, the supply of these rare qualities might be largely increased, more especially the yellow variety, which is now rarely found in large blocks.

The *Portoro*, which is obtained from the western chain of the Gulf of Spezia, is also extremely rare, if fine golden-veined specimens are required; fresh supplies might, however, be obtained by opening quarries on the other slope of the chain, where this formation passes to that of the ammonitiferous limestones of the lias and of the palaeozoic rocks.

The mixed marbles and breccias are very abundant; and, with an increased demand, they might be supplied in England and France at a lower price than the marbles of the country.

For the purpose of comparing the cost of the different varieties of marble, the following tables of the prices at the most important seats of production, and at the city of Florence, are added:—



## MIXED MARBLES AND BRECCIAS OF SERAVEZZA.

	£	s.	d.
Pallidone .....	28	16	0
Light coloured mixture (mischio chiaro) .....	20	8	0
Granitello .....	26	16	0
Breccia of Rondone .....	20	8	0
Paonazzo .....	15	12	0
Giallino (yellow) .....	22	8	0
Rosato (rose coloured) .....	22	8	0
Affricano .....	44	16	0
Campaneso .....	44	16	0
Brillante .....	44	16	0
Mischio cupo (dark mixture) .....	33	15	0
Doratello .....	44	16	0
Broccatello .....	88	0	0

## TABULAR VIEW OF THE AVERAGE ANNUAL EXPORT OF THE MARBLES OF CARRARA, MASSA, AND SERAVEZZA.

Compiled from the Customs' Register for the years 1855-59, and from Returns furnished by the Exporters.

DENOMINATION.	CARRARA.		MASSA.		SERAVEZZA.
	Tons.	Cub.Met.	Tons.	Cub.Met.	
Ambrogette (flooring slabs) .....	904	18,080	652	13,040	No. 1,000,000
Lastroni (large slabs) .....	163	1,954	1,011	12,632	"
Slabs .....	1,090	989,800	804	16,080	"
Ravaccione .....	Bardiglio and other coloured marbles. } 12,400		Bardiglio and other coloured marbles. } 1,200		Striped marble (tigrato). } Cub.Met. 5,000
White pure .....					
Do. veined .....					
Statuary, 1st quality .....	...	480	...	35	{ ... 20 ... 100
Do. 2nd quality .....					
Bardiglio, plain .....	...	...	...	...	2,500
Do. veined .....					
Do. flowered .....					
Breccias and mixtures .....	...	...	...	...	70

Of the above quantity produced, about one-third is taken by North America, another third is sent to France and England, while the remaining third supplies Belgium, Holland, Russia, Turkey, South America, and the interior of Italy. The greatest export of flooring slabs is to the Levant; the prices are from 2s. 6d. to 3s. 6d. each, for squares of 9 $\frac{1}{4}$  inches.

In 1859 the export duty on marble was abolished, so that there is no means of ascertaining the production during that year.

### 134.--39. FLORENCE NATURAL HISTORY MUSEUM (GEOLOGICAL DEPARTMENT).

#### Collection of Ornamental Stones.

##### § I.—MARBLES.

PROVINCES OF VICENZA, TRENTO, AND FRIULI.

Zuppa e Pastello, Valley de Gattene.

Alberese, called Alpina scura, Rozzo.  
Lithographic stone, Pove.  
Alpina, ash-coloured, Rozzo.  
Lithographic stone, Fontanelle di Marostica.  
Dark variegated limestone, Schio.  
Pastello granito, San Giacomo in Bastiaga.  
Pastello e roseo, San Giacomo in Roncisano.

Dark banded marble, Valli Schio.  
 Rosino, veined and yellow, San Giacomo.  
 Rosino, splashed with yellow, San Giacomo in Lusiano.  
 Lumachella (shell marble), San Giacomo in Cavele.  
 Red and yellow, San Giacomo dal Corno.  
 Red San Giacomo in Ronco.  
 Lumachella, red and white, San Giacomo.  
 Lumachella, red and white, San Giacomo.  
 Red, Cattrano.  
 Pastello, red and yellow, San Giacomo dal Corno.  
 Rosino, yellow veined, San Giacomo in Bastiaga.  
 Violet and Pastello, Valle del Sazio.  
 Lumachella, red and yellow, San Giacomo.  
 Yellow and violet, San Giacomo in Rovescio di Corno.  
 White spotted, Casare dei Zini.  
 White, Oliero.  
 White spotted, Oliero.  
 Dark ash-coloured, Oliero.  
 White and coudeed, Sarcerle di Piemonte.  
 Dark ash-coloured and veined, Casare dei Zini.  
 Ash-coloured and red, Oliero.  
 Do. spotted with black, Arsiero.  
 Ash-coloured dark veined and mixed, Recoaro.  
 Ash-coloured veined and red, Oliero.  
 Black and white veined, Oliero.  
 Dark ash-coloured, Recoaro.  
 Mixed, black and white veined, Rochetta alle Valli.  
 Spotted white and ash-coloured, Sarcerle.  
 White and dark ash-coloured veined, Sarcerle.  
 Blood-red and yellow, Rovezzo.  
 Mandolato, Fangara.  
 Celestino, blue mixed and spotted, Casoni dei Righi.  
 Africano, Valle delle Pille.  
 Breccia, white and mixed, Fangara.

White and Rosino, Oliero.  
 Breccia, Oliero.

#### PROVINCE OF BRESCIA.

White, Vione.  
 Black uniform, Val Degagna.  
 Black veined, Val Trompia.  
 Bardiglio, dark-coloured, Val Cadina.  
 Bardiglio, light-coloured, Monte Cadino.  
 Violet red, Barghi (San Gottardo).

#### PALLANZA.

(*Perona Luigi, Arnarasso.*)

White marbles of lamellar structure.

#### PROVINCE OF CUNEO (Valdieri).

(*G. Monti, Valdieri.*)

Bardiglio, pure veined.  
 „ light coloured.  
 „ ordinary.

#### SPEZIA.

Black, Palmaria, property of M. Falconi.  
 Black, Portovenere, property of Portoro fine veined, Portovenere, property of M. Falconi.  
 Portoro splashed, Palmaria, property of M. Falconi.  
 Portoro splashed, Castellana, property of M. Falconi.  
 Portoro with white markings, Portovenere, property of M. Falconi.  
 Breccia, Coregna, property of M. Cozzani.  
 Red Biassa, property of M. Falconi.  
 Red ocellated, Biassa, property of M. Falconi.  
 Broccatello, Coregna, property of M. Lamenzo.  
 Dolomia mischia, property of M. Cozzani.

#### LUNIGIANA.

(*M. A. V. Cojari.*)

Statuary, first quality.

Clear white,  
Mixed, from Vinea.  
Yellow, from Equi.

## CARRARA.

Statuary, first quality, Crestola.  
Black, Gragnana.  
Statuary, Cavetta.  
Black, Colonnata.  
Statuary, Poggio Silvestro.  
Black, veined, La Paga.  
Statuary, Fossa di Zecchino.  
Black, veined, La Foce.  
Statuary, Finocchioso.  
Black, yellow veined, Bugliolo.  
Statuary, quarry of Michael Angelo.  
Black, veined, La Paga.  
Statuary, Calacata.  
Black, veined, Bugliolo.  
Statuary, ordinary, Carpevola.  
Portoro, Rocchetta.  
Statuary, Pulcinacchio.  
Black, veined, La Paga.  
Statuary, ordinary, Betogli.  
Blue, veined, Miseglia.  
Statuary, Fossa Grande.  
Blue veined, Monte Rosso.  
White and black, Grotta Scura.  
Clear white, Canal Grande.  
Bardiglio, veined, Gioia.  
Clear white, Fossa degli Angeli.  
Bardiglio, La Paga.  
Bardiglio, flowered, Calacata.  
Clear white, La Piastra.  
Bardiglio, Il Piastrone.  
Clear white, Campanile.  
Bardiglio, Pescino.  
Clear white, Paleci.  
Bardiglio, Gioia.  
Clear white, Morano.  
Bardiglio, Miseglia.  
Clear white, Gioia.  
Bardiglio, Zampone.  
Clear white, Ciocchetto.  
Violet, Cava di Sponda.  
Clear white, Ravaccione.  
Violet, Boccanaglia.  
Clear white, Balza.  
Violet (Paona 220), Finocchioso.  
Clear white, Scalocella.  
Veined, Finocchioso.

Clear white, Battaglino.  
Spotted, Bedizzano.  
Clear white, Viticciaja.  
Colatticcio, Peschini.  
Clear white, Pendola.  
Flowered, Canalia.  
White, even, Mocello.  
Red splashed, Peschini.  
White splashed, Fantiscritti.  
Red veined, Monte d'Arme.  
Ordinary veined, Canal Piccinino.  
Red, with sparry veins, Foce.  
Veined, Belgia.  
Red splashed, Gragnana.  
Veined, Bacchiotto.  
Red splashed, Peschini.  
Veined, Vara.  
Red, Sorgnano.  
Veined, Piastrone.  
Green, Peschini.  
Veined, Fossa Cava.  
Yellow splashed, Peschini.  
Veined, Bolgia.  
Yellow splashed, Rocchetta.  
Veined, Tecchia.  
Light yellow, Monte d'Arme.  
Veined, Piastrone.  
Dark yellow, Rocchetta.  
Veined, l'Elce.  
Alabaster, Al Forno, Massa.  
Yellow marble, with dark veins, Al Forno, Massa.

## MASSA.

*(Italian Marble Company. Società  
Marmaria Italiana.)*

Ravaccione.  
Veined.  
Statuary, second quality.  
White veined.  
Statuary, first quality, quarry of Rodolfo, valley of Sainetto.  
Bardiglio, first quality, quarry of Poggio Cipollo, valley of Piastrone.  
Statuary, first quality, quarry of Avenate, valley of Piastrone.  
Clear white, first quality.  
Statuary, first quality.  
White spotted.  
White veined.

*(Count Paolo Guerra.)*

White ordinary, Confine, valley of Tainetto.

White veined.

Statuary, spotted.

White veined, Lomari, valley of Antona.

Statuary, Capraria, valley of Antona

Statuary, Nido del Corvo, valley of Casania.

Statuary, spotted, Poggio Cipollo, valley of Casette.

Ordinary, white, Costa Grande, valley of Casette.

Ordinary, spotted, Balloni, valley of Casette.

Light Bardiglio, Balloni, valley of Casette.

White veined and spotted, Lavagnino, valley of Casette.

Ravaccione, Morchio, valley of Altagnana.

Bardiglio, splashed, Morchio, valley of Altagnana.

Tigrato, striped, Madielle, valley of Altagnana.

Splashed, Madielle, valley of Altagnana.

Veined, Costa Grande, valley of Altagnana.

Persichino, Vestito, valley of Renaia.

Statuary, first quality, Campo Francesco, valley of Taneto.

Ravaccione, Campo Francesco, valley of Taneto.

Statuary, Taneto, valley of Taneto.

Mixed,

Statuary, Cava Bassa, valley of Palazzuolo.

Statuary, Cava Alta, valley of Palazzuolo.

MASSA AND GARAFAGNANA.

*(A. E. Santini.)*

Dark coloured mixed marbles, and breccias of various colours, from Frigido.

Statuary marble, first quality, from Arni.

Three samples of white marble, and one of ottrelitique, from Campanice.

Large sample of ottrelitique marble, from Arni.

SERAVEZZA.

TRAMBISSERRA.

*(Rossi, Brothers.)*

Clear, and ordinary white marbles.

TRAMBISSERRA, CAPPELLA, AND COSTA.

*(Garfagnini, Brothers.)*

Various white marbles.

Bardiglio, plain and veined.

QUARRIES OF PISCIAROTTE.

*(G. W. Arata, Seravezza)*

Slab of flowered Bardiglia.

STAZZEMA.

*(A. Boldrini, Seravezza.)*

Breccia giallo-paonazza.

VARIEGATED MARBLES AND BRECCIAS OF SERAVEZZA.

Pallidone, Mulina *(Tonini, Brothers)*.

Mischio (mixture), Piastraio *(Tonini, Brothers)*.

Granitello, Campania *(G. Santini)*.

Rondone, Ponte le Mulina *(Fanny Beresford)*.

Paonazzo (violet), Laghetto *(A. Boldrini)*.

Giallino (light yellow), Timo *(V. Muraglia)*.

Rosato (rose coloured), Le Fontane *(P. Pieroni)*.

Africano, Le Fontane *(V. Muraglia)*.

Campanese, Puntato *(G. Santini)*.

Brillante, Monte Pioto *(G. Santini)*.

Mischio cupo (dark mixture), Stazzema *(G. Luchini)*.

Doratello, Sasso rosso *(G. Santini)*.

Rosso puro (pure red), Stazzema *(V. Muraglia)*.

Giallo scrivo, Pruno *(L. Ulivi)*.

Broccatello, Monte Pioto *(G. Santini)*.

Matanna, Matanna, *(G. Tesser)*.

## MARBLES OF MONTE CORCHIA.

(A. Simi.)

Snow-white statuary.  
 Persichino.  
 Cerulean white statuary.  
 Breccia persichina.  
 Clear white statuary.  
 Veined statuary.  
 Splashed statuary.  
 Parti-coloured breccia.  
 Ordinary white.  
 Ordinary veined.  
 Red marble from Camajore, Lucca,  
 property of Mr. Bertagna.  
 Large block of red marble from Cama-  
 jore, Lucca, property of Mr. Ber-  
 tagna.

PROVINCES OF PISA AND LUCCA,  
MONTI PISANI.

Bardiglio, S. Lorenzo a Vaccoli.  
 Bardiglio, veined, S. Lorenzo a Vaccoli.  
 Bardiglio, veined with yellow, S. Lo-  
 renzo a Vaccoli.  
 Bardiglio, Santa Maria del Giudice.  
 Ordinary marble, Monte Penna.  
 Ordinary marble, S. Lorenzo a Vaccoli.  
 Ordinary marble, Alla Maginetta.  
 Ordinary marble, Pozzuolo.  
 Yellow breccia, S. Maria del Giudice.  
 Yellow breccia, Castel Maggiore.  
 Lumachella, Monte Penna.  
 Ordinary veined, S. Maria del Giudice.  
 Ordinary veined, S. Maria del Giudice.  
 Ordinary veined, Agli Scarpellini.  
 Lumachella, Castel Maggiore.  
 White ordinary, S. Maria del Giudice.  
 Yellow and dark, Castel Maggiore.  
 Splashed yellow, S. Maria.  
 Yellow, uniform in colour.  
 Lumachella, S. Giuliano.

## PROVINCE OF SIENNA.

RENIERE ESTATE IN THE MONTAGNOLA  
SENESE.

(G. Nomis.)

Statuary, Quarry dell'Opera.  
 Ordinary splashed, ditto.  
 Bardiglio, light-coloured, ditto.

Bardiglio, black, ditto.  
 Yellow breccia (not quarried), Meletro.  
 Yellow, passing into grey.  
 Veined yellow.  
 Yellow, even in colour, Camperone.  
 " " " Ferra Salata.  
 " " " Meletro.

The last qualities can be supplied in large  
 quantities and in large blocks.

## DELLE CERBAIE ESTATE.

(Count B. Tolomei.)

Samples of white, yellow, and broc-  
 catelli marbles.

## CAMPIGLIA.

Red Bardiglio, Monte Calvi.  
 " " Monte Romboli.  
 Rosso brecciato (red breccia), Piano ai  
 Carpini.  
 Rosso brecciato, Santa Lucia.  
 " " Monte Calvi.  
 " " Piano ai Carpini.  
 White " Monte Calvi.  
 " " Monte Rombolo.  
 " " Alliata.  
 " " Sinigaglia.  
 " " Acquaviva.  
 Alberese, Allumiere.  
 Travertino.

## MARBLES OF MONTE ROMBOLO.

(Cave Perdicari.)

Ordinary quality, Cava Medici.  
 " " lamellar, CavaGiove.  
 Ordinary statuary, called Grechetto.  
 Lamellar statuary, called Parian.  
 Veined Parian.  
 Bardiglio, lamellar and veined.  
 Statuary, Parian.  
 " Cava Nuova.

## UMBRIA (DISTRICT OF RIETI).

Alabaster, S. Antonio.  
 Red, yellow veined, Cattanello.  
 " spotted, Contigliano.  
 " ocellated (occhiato) Contigliano.  
 Alberese, Cesapiana.

Light red, Stroncone.  
 Banded red, ditto.  
 Breccia, Le Corone.  
 Alberese, Rieti.  
 Red breccia, San Lorenzo.  
 Travertine, L'Annunziata.

#### PROVINCE OF ASCOLI.

Neocomian breccia, Montagna di Ascoli.  
 Neocomian, of a brighter colour, ditto.  
 Dolomite, Monte Vettore.  
 Red marble from the middle lias, Monte Vettore.  
 Lower lias marble, Monte Vettore.

#### PROVINCE OF FOGGIA.

Red marble.  
 Travertine.  
 Amygdaloidal breccia (mandorlata).  
 Yellow marble.  
 Breccia, called di Francia.  
 Flowered marble.  
 Oriental alabaster.  
 Veined breccia.

Persichino.  
 Bardiglio.

#### PROVINCE OF TERRA DI LAVORO.

Particoloured breccia, Pietraroia.  
 Coarse breccia, "  
 Yellow veined breccia, "  
 Spotted marble, "  
 Light coloured breccia, Mondragone.  
 Eruptive rock, Pietraroia.  
 Particoloured breccia, Mondragone.  
 Black marble, Caserta Vecchia.

#### PROVINCE OF AQUILA.

(*Professor Alessandri*)

Striped breccia, Arischia.  
 Breccia, Lucoli.  
 Red marble, Arischia.  
 Veined breccia, Pezzoli.  
 Breccia, Antrodoco.  
 Nummulitic marble, San Bernardino.  
 Veined breccia, Lucoli.  
 Breccia, Pezzoli.  
 Lunachella, Revisondoli.  
 Yellow marble, Revisondoli.

### § 2. LITHOGRAPHIC STONES.

The Lithographic limestones of Bassano are the object of a small trade. The rocks known as *Biancone*, found at Arco, near the Lake di Garda, are of a very compact and homogeneous texture, resembling the Bavarian stone. Some of the varieties of *alberese* from Perugia also appear to be of good quality. The following lithographic stones are in the collection of the Royal Museum of Natural History of Florence :—

Biancone,	province of Trento.
Alberese,	" Tuscany.
White stone	" Urbino.
Macutriata,	" Urbino.

Lithographic stone, first quality,	pro-
vince of Bassano.	
Lithographic stone, second quality,	pro-
vince of Bassano.	

### § 3. ALABASTER.

Sulphate of lime occasionally becomes of value as an ornamental stone, in addition to its importance for making cement, and similar purposes. The siliceous anhydrite or vulpinite, also called *Bergamasc bardiglione*, is largely worked in Lombardy, where it is employed for a variety of purposes in the place of marble.

The hydrated sulphate of lime, when subjected to a special kind of metamorphism, assumes a structure and appearance analogous to those of marble. When free from foreign substances it assumes a finely crystalline structure, is of a pure white or delicately tinted colour, and is beautifully translucent. Of this class is the celebrated alabaster of Volterra, in Tuscany. The price of the clearest alabaster at Florence is £28 the cubic metre, but it is rarely that pieces of this size can be obtained, as it is found in large spheroidal or kidney-shaped masses, varying from one-half to one metre in diameter. It is customary, therefore, to sell it either by the palm or more commonly by weight.

The finest alabaster comes from the Valley of the Marmolaio, near La Castellina, where there

is a bed of marls about 10 ft. thick, from which crystals of gypsum and the alabaster spheroids are obtained.

The next in order of importance is the agatized alabaster, which is remarkable for its fine colour, usually of a reddish cast, and its extraordinary translucency.

It is remarkable that the agatized alabaster is not susceptible of being artificially coloured, while in the clear varieties, effects of colour, more particularly in yellow and dark tints, can be obtained by the action of heat. The operation is a delicate one, requiring considerable experience for its successful operation. The dark tints are obtained at a low temperature, while the yellow colour requires a long continued heat for its production.

The alabaster districts are the seat of an important artistic manufacture, for in addition to the amount exported in the raw state, a large quantity is worked up into reduced models of the more famous statues and architectural monuments, the whole of which are exported to foreign countries. Alabaster is easily carved, but it requires considerable practice to give the proper polish and transparent effect to the finished work, by removing the *morto* or dead powdery mark left by the tool. This is effected by heating it with boiling water in a peculiar manner.

#### ALABASTER OF VOLTERRA.

Statuary alabaster.  
White alabaster.  
White alabaster, spotted.  
Flowered alabaster.  
Flesh-coloured alabaster.  
Veined alabaster.  
Spotted alabaster.  
Bardiglio alabaster.  
Striped alabaster  
Yellow alabaster.  
Agatized alabaster.  
Translucent statuary alabaster.  
Opaque white alabaster.  
Flowered alabaster.  
Dark flowered alabaster.  
Mixed alabaster.  
Dark alabaster.  
Clear white alabaster.  
White veined alabaster.  
Dark grey alabaster.  
Black spotted alabaster.  
Light grey alabaster.

#### ST. LORENZO ALABASTER.

Agatized alabaster.  
Flowered "  
Flesh-coloured alabaster.  
Yellow "  
Veined "  
Variegated "  
Veined "  
Bardiglio "

#### POMERANCE ALABASTER.

The same qualities and arrangement as the preceding.

#### ALABASTER AND VARIOUS ORNAMENTAL STONES.

##### MONTERUFOLI AND CASELLA.

(*N. Maffei*.)

White alabaster, Ariano.  
" " Aiaccia.  
Bardiglio alabaster, Ariano.  
Yellow alabaster, Aiaccia.  
" " Ariano.  
Yellow breccia, Gli Scopai.  
Eocene breccia, Malentrata.  
Porphyritic Aphanite, Colle alle Monache.  
Green and violet serpentine, Gli Scopai.  
Dark veined serpentine, Gli Scopai.  
Light green " "  
Dark green " "

##### ALABASTER (FROM VARIOUS LOCALITIES).

Oriental alabaster, Montalcino.  
" " Volterra.  
" " Massa.  
Nummular breccia, called Granitello.  
Light blue arragonite, Gerfalco.  
Polcevera, Genoa.  
Jasper, Monte Rufoli.  
Siliceous breccia, Casentino.

##### SAN LORENZO.

Eocene breccia, light-coloured.  
" " dark-coloured.  
" " spotted.  
Siliceous serpentine.  
Spotted "  
Serpentine conglomerates.

## 4. HARD STONES.

Several different kinds of quartz, including the glassy, amorphous, translucent, opaque, and coloured varieties, and various kinds of jaspers, and other metamorphic, slaty, and calcareo-argillaceous rocks, are largely employed in certain classes of ornamental work, more especially in the larger articles of jewellery, and for intaglios, cameos, &c., as well as for the famous Florentine mosaics.

The position and characters of the deposits of hard stones will be noticed under the headings of their different exhibitors.

The jaspers of Giarreto, Barga, and Sicily, and the calcedony of Monte Rufoli are very famous, and are used, not only for engraving and mosaic work, but as they can be obtained in masses of a certain size, they are occasionally used for the more costly kinds of architectural ornament. Examples of this application are to be seen in several of the monuments of Florence.

The light blue arragonite of Gerfalco is a rock of considerable hardness, and on account of its beautiful colour it is much used for works of marqueterie.

Another variety of ornamental hard stone is the *Pietra paesina*, or Rimaggio stone, which is also called ruin marble of Florence, from the curious markings, bearing a fancied resemblance to ruined buildings. This curious substance is a particular form of the *ciottolo* of Arno, a rock which is much used in the manufacture of cheap mosaic work at Florence.

Common transparent opal, Island of Elba.

Common white opal, Piedmont.

" " " St. Pierre, Island of Elba.

Common white opal, Piedmont.

" " " Island of Elba.

Yellow ferruginous opal, Capoliveri, Island of Elba.

Ferruginous opal, Capo Calamita, Island of Elba.

Common light blue opal, Island of Elba.

Green opal, Monte Rufoli, Volterra.

Blue ferruginous opal, Island of Elba.

Common blue opal, Island of Elba.

White opaque " "

Greyish green " "

Stalactitic opal, Santa Fiora (Fiorite).

Yellow calcedony, Monte Rufoli (Tuscany).

Greenish calcedony, Monte Rufoli.

Yellow " "

Yellow and red calcedony, Monte Rufoli.

Spotted calcedony, Monte Rufoli.

Whitish-grey silex, Monte Nero, in Terra Sabina.

White banded silex, Norcia.

Whitish grey silex, Monte Nero, in Terra Sabina.

Grey silex, Milanese.

Reddish and grey silex, Norcia.

Opaque " "

Reddish " "

Red silex, Camerino (the Marches).

White and grey banded silex, Monte Nero, in Terra Sabina.

Reddish silex, Camerino.

Dark grey silex, Norcia.

Grey and blue silex, Casentino (Tuscany).

Transparent brown silex, Casentino (Tuscany).

Transparent Arno silex, Florence.

Light transparent silex, Sicily.

Grey silex, Island of Elba.

Pink " Maris (Sardinia).

Reddish brown silex, Milan.

Dark-reddish " "

Arno grey " Florence.

Brown " Milanese.

" " Sicily.

Green jasper, Sicily.

Light grey silex, Monte Nero, in Terra Sabina.

Dull grey silex, Milanese.

Grey and blue agate, Volterra.

Silex Vicentin.

Blue jasper, Casentino (Tuscany).

Grey and white jasper, Casentino (Tuscany).

Brown veined Arno jasper, Florence.

Brown jasper, Casentino.

Red oolitic jasper, Sicily.

Red jasper, Sicily.

Yellow and red jasper, Brescia.

Red " "

Dark and red " "

White and yellow agate, Brescia.

White and light blue agate, Monte Rufoli (Tuscany).  
 White and yellowish agate, Sicily.  
 „ dark Siennese, Tuscany.  
 Dark jasper, Sicily.  
 „ and yellow jasper, Sicily.  
 Reddish silex, Milan.  
 Red and yellow silex, Norcia.  
 Whitish grey silex, Norcia.  
 Yellowish agate, Sicily.  
 White and blue agate, Monte Rufoli (Tuscany).  
 White spotted agate, Sicily.  
 Red agate, Sicily.  
 White silex, Monte Nero, in Terra Sabina.  
 White and light blue silex, Casentino.  
 Blue calcedony, Monte Rufoli.  
 Reddish jasper, Milanese.  
 Banded agate, Siennese.

Reddish jasper, Sicily.  
 Green spotted jasper, Sicily.  
 Yellow and green jasper, Sicily.  
 Yellow jasper, Sicily.  
 Yellow and red jasper, Sicily.  
 Red jasper, Milanese.  
 Felspar, San Gothard.  
 Syenite, Baveno.  
 Corundum, Biella, Piedmont.  
 Corundum, Compolanzo (San Gothard).  
 Very siliceous ruiniform limestone (ruin marble), Monte Nerone (Umbria).

#### PAESINA STONE (RUIN MARBLE).

Three specimens of Rimaggio, near Florence.

### § 5. SERPENTINES AND OPHIOLITIC ROCKS.

In the provinces of Liguria and Tuscany the serpentinous rocks are of considerable interest, whether we regard them from an economic or a scientific point of view; and the determination of their age, together with the study of their composition and probable origin, is one of the most interesting points in Italian geology.

The ophiolites, or older serpentines, are found in several varieties, some of which are extremely beautiful, and are much used for artistic purposes, such as the manufacture of small ornaments of a low price, table tops, &c. For these and similar purposes the serpentines may be considered fairly equal, or even superior to coloured marbles and alabasters, as will be seen by an examination of the specimens exhibited, the ornamental works of M. Federico Bacci, of Florence, the tables made of Prato serpentine by Messrs. Giovannini, Brothers, of Carmignano, and the samples from the quarries belonging to Mrs. Teodora Caporali, near Leghorn.

The same cannot be said of serpentine as a substitute for marble in external architectural decorations. The unequal hardness of the minerals which compose it, the presence of iron, and an easily decomposable mineral diallage, as well as the readiness with which it cracks and splits, are conditions which should prevent its use in work of a certain order and value. Experience shows that the best dark-green variety, or Prato black, when kept for some years in imperfectly ventilated lower rooms, undergoes considerable alteration. This alteration may be observed in modern as well as in ancient monuments, especially at Florence. At Pisa, where the Prato serpentines have not taken the place of the magnificent black marble of the Bagno alla Duchessa, the contrary effect is remarked, black marble fully equaling white in durability.

Nearly all the finer varieties of serpentine are found in small pieces, and for this reason can only be employed in the manufacture of small objects. As they are not very hard, they are easily worked, even in the turning lathe. Glue may be used to cement the fragments that unavoidably chip off in making, but this circumstance renders it necessary to keep them from damp.

Euphotide or grainstone is a very abundant rock. The coarse-grained variety is used for mill-stones, under the name of Prato granite; other compact and brilliantly coloured varieties are employed as ornamental stones. Their hardness, however, causes them to be used only in the production of small and costly works.

Porphyritic aphanite, sometimes penetrated by euphotide dykes, as may be seen in one of the specimens, is a very beautiful and rather uncommon rock, which is found under the same conditions as the preceding one. The finer porphyritic variety is used as an ornamental stone, but otherwise it is more generally employed for building purposes.

Serpentines containing an admixture of siliceous or calcareous matter, are known by the

names of the ophissilices and ophicalcalc. The former are very hard, and found in small quantity, while the latter class are of great commercial importance and value. The finest are from the Valley of Polcevera, near Genoa. Those from the Island of Elba and various parts of Tuscany are also very beautiful. Mr. Gaetano Galligani, of Seravezza, sends to the Exhibition a table made of the rare variety called *Verde di Genova* and *Pegli*, which is of extraordinary beauty.

### 1.—SERPENTINES OF PRATO.

Bottle green, called *Nero di Prato*.  
Dark green with light stains.  
" " " dark stains.  
Mixed light green.  
Dark-stained.  
Light-coloured veined.  
Ranocchiaia.  
Brizzolato (small stains).  
Mixed light green.  
Light-stained.

### 2.—SERPENTINES OF THE IMPRUNETA (FLORENCE).

Dark green, called black.  
Light green with black splashes.  
Euphotide.  
Mixed dark green.  
" light green.  
Polcevera (Liguria).

### 3.—SERPENTINES FROM VARIOUS LOCALITIES.

White steatitic serpentine, Mont Vaso.  
Darker steatitic serpentine, Mont Vaso.  
Ranocchiaia, Botro alle Donne (Castellina).  
Ranocchiaia, Castellina marittima.  
" Miemo.  
Very light green serpentine, Miemo.

Splashed serpentine, Miemo.  
Light-coloured serpentine, Pomarance.  
Light-coloured serpentine, Island of Elba.  
Light-coloured serpentine, Rocca Sillana, Pomarance.  
Light-coloured serpentine, St. Ippolyte.  
Light green serpentine with steatite, Pomarance.  
Light green serpentine, Val di Magra.  
Light green serpentine, Riparbella.  
" " Impruneta.  
" " Monte Ferrato (Florence).  
Reddish ranocchiaia, Rio, Island of Elba.  
Red ranocchiaia with felspathic veins, Island of Elba.  
Dark green ranocchiaia, Belverone (Val di Vera).  
Stained ranocchiaia, Garfagnana.  
Reddish serpentine, Rocca Federighi.  
Greenish serpentine with red stains, Impruneta.  
Greenish serpentine with red stains, Island of Elba.  
Light ground serpentine, dark stains, Island of Elba.  
Dark ground serpentine, light stains, Island of Elba.  
Serpentine with steatitic veins, Libbiano.

## § 6. GRANITES AND FELSPATHIC ROCKS.

Granite rocks are extensively quarried in Upper Italy, as well as in many places in the central and southern provinces. The granite of Pallanza is largely used, and the syenite of Baveno affords employment to many hundred workmen; and several thousands of cubic yards, representing a value of £16,000, are annually produced. Two specimens are exhibited in the collection forwarded by the Museum of Natural History at Florence, one from the quarries of Mr. Fedele de Giuli the other from Baveno, contributed by Mr. Luigi Adami.

These granites, by reason of their high price and fine effect, must be classed among the higher ornamental stones. The eighty-two columns and eight pilasters used in the construction of the church of St. Paul at Rome, were obtained from the quarries at Monte Orfano, as well as the large column for the monument of the Virgin of Peace, at Naples. Various quarries at Baveno have furnished the granites recently used in the erection of a great number of public buildings in Northern Italy, and more especially in Turin.

The granites used in Sardinia are represented by some specimens in the collection, and were sent by the Commissioner of Tempio. In the Islands of Elba, Giglio, and Monte Cristo a tertiary granite, containing tourmaline, is found, which is also met with in Tuscany. It is as yet but little used, although blocks and columns of almost any size may be had. The specimens are from the collection of the Island of Elba, presented by the Marchioness of Boissy, and from the collection of the Royal Museum of Natural History at Florence.

Volcanic rocks, whether of igneous, sedimentary, or metamorphic origin, are employed for common business purposes wherever they are abundant and easily procured. In various Italian provinces we therefore see in use trachyte, basalt, lavas, volcanic tufa, peperinos, &c.

In certain districts in the north of Italy a kind of phonolite, which possesses the property of splitting into thin laminæ is used for roofing houses in preference to slate, as it resists wet and frost better, and is also cheaper.

All these rocks are represented by specimens from different provinces, among which the most remarkable are from the Agro-Romano.

Tourmaliniferous granite (recent or tertiary granite), Island of Giglio.

Tourmaliniferous granite, Island of Elba.

Piedmont granite.

Leucitophire, Lazio.

Obsidian, Naples.

Porphyritic aphanite, Tuscany.

Hypersthene rock, the Alps.

Syenite.

Basanite, Vicentin.

Variolite, Bolsena.

Reddish euphotide, Tuscany.

Black lava, Naples.

Trachyte.

Syenite.

Lava.

Diorite.

Peperino.

Basalt.

Volcanic tuf.

## § 7. SCHISTOSE ROCKS.

The most important of the materials furnished by this group are the slates, which are known as Lavagna stones, or simply *Lavagne*.

Near Seravezza excellent slates are obtained from the oolitic beds at Stazzema, Cardoso, and Pomezzana. They are principally used for covering roofs and the ceilings of rooms, for which purpose slabs of about a yard square are employed, laid upon cross beams, and afterwards plastered.

The most celebrated and important slate quarries are in the eocene rocks at St. Giacomo, near the suburb of Lavagna, which is two or three miles from Chiavari, and somewhat nearer to the sea on the western coast of Genoa. They have from time immemorial been worked by a numerous and industrious population, and are considered to be a greater source of riches to the surrounding country than gold or silver mines.

The slates of Lavagna are employed for a great variety of purposes, including the covering of roofs, and in thicker slabs for floors, door lintels, stair treads, hearth stones, tanks, table tops, and black boards for writing on with gypsum or French chalk. The slates of Lavagna are superior to those produced in the other quarries, as well as being lower in price.

Large jars or reservoirs for containing oil, also made of slate, are employed in Liguria, as well as in the principal maritime depots of the oil trade.

The slate of San Giacomo is applicable to almost every detail of both internal and external construction; it is particularly well adapted for low-priced chimney pieces, as it is capable of receiving an excellent polish. The application of slate in the place of black marble, under the name of "Poor man's marble," is due to Mr. Gaetano Descalzi.

A table-top, measuring 70 inches by 27 inches, is sold for about 5s., the price of the slate being calculated at 2s. 8d. and the workmanship at 2s. 4d. A well-polished slab, 39 inches square, or an unpolished one of 66 inches by 39, is sold for 4s. 2d., and so on in proportion to the dimensions for other sizes. These low prices cause it to be much used instead of marble for the tops of tables, washstands, &c.; and a chimney-piece of the same material is exhibited, costing only 4s.

Mr. Andrea Costa has applied the slate of Lavagna to various purposes for which wood is usually employed; by taking advantage of the natural dark colour, very agreeable effects may be cheaply produced, as will be seen by an inspection of the two specimens exhibited.

The number of slate quarries now open in the Lavagna is about 160, employing 1,500 workmen, and representing a capital of about £16,000.

The palæozoic rocks of Verrucano, in Tuscany, furnish various kinds of stones, which are employed for economic purposes; the anagenites or jaspideous conglomerates make good millstones, and the steatitic and mica slates are good building materials, which are easily extracted, and can readily be divided into their laminæ.

Steatitic slate.

Mica slate.

Calcareous slate.

Slate.

## § 8. LIMESTONES.

These are largely employed for building purposes. The principal kinds are—the travertines which occur in many places, the compact limestone or *alberese*, the saccharoidal or crystalline, the shelly varieties, and others of more or less utility. The lenticular rock of San Frediano in Tuscany, which is almost entirely composed of small species of micene nummulate, is often very friable, in which state it forms good road metal; the harder varieties are employed for various works of construction.

The rock called *Pietraforte*, which has of late years formed the subject of much geological inquiry, is very largely used in Florence; it is very durable, as may be seen in the older palaces of the city. In composition it is an arenaceous limestone, which is very hard and unalterable, as its name implies.

The red limestone of Belliemi, in Sicily, deserves to be particularly noticed as furnishing a substitute for true marble, at the low price of 56s. per cubic metre, or about 2s. per cubic foot.

In Northern Italy, a variety of oolitic limestone is used for making tubes. The boring is effected by lathes driven by water power. These tubes are of different diameters, and are made in lengths of 39 inches and upwards, and employed for the conveyance of water.

The principal seat of this manufacture is in the neighbourhood of Trento. In the Italian Exhibition of 1861, the jury reported favourably with regard to the solidity of these tubes and their impenetrability to water under a pressure of 135 lbs. to the inch, which was the highest that the testing apparatus allowed.

The prices per metre (39 inches) are as follows:—

	s.	d.
Up to 2½ inches diameter .....	1	8
3½ " " .....	2	1
4 " " .....	2	6
4½ " " .....	2	10
5½ " " .....	3	8
6½ " " .....	5	2
7½ " " .....	6	5

The collection from the Museum of Florence contains samples of the following limestones:—

Crystalline limestones.

Granular do.

Compact do.

Alberese do.

Travertine.

Lenticular limestone.

Oolitic do.

Tubes made from limestone.

## § 9. SANDSTONES.

First in this group, we have the siliceo-calcareous sandstone (*arenaria macigno*) of the Apennines, in fine, medium, and coarse-grained varieties. The first of these, known by the name of *Pietra Serena*, is well adapted for internal ornament, but is gradually decomposed when exposed to the vicissitudes of the weather. In some places, and more particularly at Spezia, there is a large export of this stone to the East, about £800 worth being shipped monthly from that port. The quarry of Gonfolina occasionally supplies some large blocks for the foreign trade.

The oldest and most famous of the quarries producing these sandstones are those of Monte Cecei, a little to the east of Fiesole. Ever since the time at which the Cyclopean walls of that city were reared, a continuous supply of excellent sandstone has been drawn from its quarries; and the workings have gradually penetrated deep into the interior of the mountain, forming a picturesque series of large chambers, with massive pillars supporting the roof.

There is no means of arriving, even at an approximate idea of the money value of these materials, as most of them are only employed locally, and the prices vary with the different localities, and there are no statistical returns of the production of the quarries. It would

occupy too much space to add a more detailed account of the varying characters and technical uses to which these rocks are applied; but we may be permitted to hope that the introduction of railways will lead in many cases to the laying aside of bad local materials, and the substitution of superior qualities of stone brought from other places:—

Pietraforte.  
Arenaria Macigno.

Arenaria delle Parrane, &c. (siliceo-argillaceous sand stone of the Apennines).

#### § 10. MILL STONES, WHET STONES, SAND.

The rocks principally employed for mill stones are certain kinds of anagenite, a coarse-grained euphotide, and serpentinous breccias.

Sharpening stones are principally obtained from the variegated schists of the Apuan Alps; they are the object of considerable trade, the seat of which is at Spezia. Six examples of razor-hones, in various stages of preparation, are exhibited. The price on the spot varies from 5d. each upwards, according to size and quality.

The best whet stones are obtained from the sandstones of Macerata di Feltre, in the Marches.

Sharp siliceous sands are found in several places; the best is got at Massacciuccoli, Pietrasanta, where it is largely worked for supplying the numerous marble sawing establishments of Carrara, Massa, Seravezza, and Pietrasanta.

The sand of Pesaro is used instead of emery for cutting stones which are harder than ordinary marbles.

Euphotide. (See Serpentine and  
Felspathic Rocks.)  
Arenaria of Macerata di Feltre.

Hone stones from the Posidonomya  
slate of Spezia, in various stages  
of preparation.

#### SPECIAL COLLECTIONS.

These collections, which include under one heading articles of a miscellaneous character, have been arranged as much as possible according to the most important object in each one. The explanatory notes refer back chiefly to the descriptions already given of the collection from the Museum of Natural History at Florence. In many cases additional information has been obtained and added.

These collections are arranged in alphabetical order, according to the names of the exhibitors, instead of following the geographical arrangement hitherto employed.

#### MARBLES, ALABASTERS, SERPENTINES, HARD STONES, &c.

##### MARBLES.

#### 136.—125. BOISSY, Marchioness TERESA, *Settimello (Florence)*.

Ordinary white marble, Island of  
Elba.

Lamellar statuary, or Parian marble.  
Yellow marble.

Serpentine of different qualities.

Two specimens of granite.

Yellow earth.

Red earth.

The Marchioness Boissy has here skilfully united into one collection specimens of the various marbles and ornamental rocks for which the Island of Elba is justly celebrated. Notices of these will be found in the preliminary remarks on marble, at page 44. Most of these marbles can be obtained in blocks of almost any size; as an example we may mention that the statue of Leo XII., in St. Peter's Cathedral at Rome, was cut from a block weighing twelve tons, from these quarries.

#### 137.—15. BRESCIA, ATHENÆUM OF.

Collection of rocks and marbles of  
the province of Brescia.

For a description of these see page 44.

**138.—16. BUCCI, JOSEPH, *Campobasso (Molise).***

Collection of marbles.

**139.—18. CAGLIARI (SUB-COMMITTEE).**

A collection of sixty examples of the building and ornamental stones of the island of Sardinia.

**140.—129. FOGGIA (ROYAL ECONOMIC SOCIETY), (*Capitanata*).**

A collection of the marbles of Monte Gargano :—

Black breccia.

Flowered marble.

Yellow ditto.

Black ditto.

Banded alabaster.

Argentine (clear silvery) alabaster.

Red breccia.

Yellow travertine.

(For description see page 48.)

**141.—2101. GALLICANI, GAETANO, *Seravezza*.**

Table top of flowered bardiglio, from the quarries of Mr. Sancholles Henreaux, at Retignano, near Seravezza.

Slabs of Polcevera green serpentine near Genoa.

Vase in *Rosso di Levante*, upon a column or pedestal of veined bardiglio, with the base made of statuary marble from Monte Altissimo.

**142.—53. GUERRA, BROTHERS, *Massa (Carrara)*.**

A large column.

Small columns for balusters.

Balusters of a more ornamental character.

Two tazzas for gardens.

A pedestal made hollow.

Two tubes made from the core cut out of the above pedestal.

Two smaller tazzas.

Two tazzas made of mixed marble (*mischio*).

A large fountain, with three basins.

A similar fountain of smaller size.

A white marble chimney piece.

A table slab of breccia persichino.

A table slab of red mixed marble from Zucchi Rossi.

A similar table, with a pedestal, made of the marble of Nido del Corvo.

The above are good specimens of the qualities of marbles produced in the quarries belonging to Messrs. Guerra Brothers. The works belonging to the same firm are remarkable as being the first in which the circular saw was introduced for marble cutting.

**143.—2103. HAHNER, C. F., *Leghorn*.**

White marbles from Massa.

**144.—59. JACOBELLI, Cav. ACHILLE, *Benevento*.**

Samples from the various quarries of Vitulano and Pietraroia.

The samples of marbles of Pietraroia have already been noticed in describing the marble collection of the Museum of Florence.

**145.—63. MAFFEI, Cav. NICCOLO, *Volterra*.**

Chimney pieces and tables of calcareous breccia.

The factory of Monte Rufoli, belonging to Messrs. Maffei and Co., is famous for its abundant production of ornamental articles in stone, more especially in calcedony. The large articles in calcareous breccia, exhibited by this firm, give a better idea of the beauty of the material than can be obtained from the small specimens in the Florence Museum collection. The stone can be obtained in large masses, and can be sold at a low price, delivered at Leghorn.

**146.—79. MONTE ALTISSIMO COMPANY (*Anonima Società del Monte Altissimo*) *Florence*.**

Statuary marble of Falcovaja, 1st quality.

Block of marble of 2nd quality.

Ditto of ordinary marble.

Clear white marble of La Polla, 1st quality.

Clear white marble of La Polla, 2nd quality.

Clear white marble of La Polla, common.

Red marble from Terrarossa, in Garfagnana, Castelnuovo.

The statuary and other white marbles exhibited by this company are to be regarded as types of the highest excellence in their respective classes.

The statuary marble of Falcovaja, which is universally admitted to be of unequalled excellence, is sold on the spot at the price of 16s. per Genoese palm, or about 37s. per cubic foot; but for blocks of first quality, exceeding 100 palms in size, the price is raised to 24s. per palm, or 55s. per cubic foot. The quarries of Monte Altissimo were opened by Michael Angelo, and furnished the material for several of his works, and, in later times, for the works of Messrs. Pampaloni, Dupré, Fedi, Fantacchiotti, Bartolini, Powers, Fuller, and many other contemporary sculptors. The marbles for the church of S. Isaac, at S. Petersburg, have also been drawn from the same source, and the quarries are now supplying materials for the façade of the Italian Pantheon, the church of Santa Croce, in Florence. The annual produce is about 5,000 to 6,000 tons in blocks of all sizes and shapes, which when they reach the foot of the incline leading from the quarries to the base of the mountain, are reduced to a more regular form, in order to facilitate their transport to the shipping place.

The greater part of the produce is exported to London and New York. From 100 to 150 persons are employed by the company.

**147.—85. ORFINI, Count, Foligno (Umbria).**

Two slabs of compact and veined alberese marble.

The beauty and importance of the marbles from the quarries of Count Orfini have already been mentioned at page 48.

**148.—2080.\* PARMA (ROYAL MUSEUM OF NATURAL HISTORY).**

Marbles, jaspers, serpentines, minerals, and fossils, of the province of Parma.

**149.—144.\* PERELLI, GIROLAMO, Laurino (Salerno).**

Stone and marble from the quarries of Laurino and Laurito.

**150.—148.\* PODESTÀ, DOMENICO, Sarzana (Genoa).**

Bardiglio marbles from Capo Corvo.

Very black marble from Monte Caprione.

**151.—2090\*. RUSCHI, PIETRO, Sarzana (Genoa).**

Red marble from Monte Caprione.

**152.—100. SANTINI, GIUSEPPE, Seravezza (Lucca).**

Statuary marble, 1st and 2nd qualities.

Clear white marble.

Oolitic limestone.

Mr. Santini, of Seravezza, who is one of the most enterprising and intelligent of the proprietors of marble quarries, has contributed largely to the increase of this important industry. His quarries are situated in the heart of the mountain region of Seravezza, and they produce excellent statuary marble of first quality, which could be supplied in large quantities if the present difficulty of transport were removed by the construction of a good road from the quarries to the lower country. (See page 54.)

**153.—58. ITALIAN MARBLE COMPANY (Società marmorea italiana), Leghorn.**

Statuary marble.

Clear white marble.

Veined "

Coloured "

" " of a whitish tint, from San Vitale de Baganza.

**154.—39. SIMI, CAV. ANGELO, Seravezza.**

White marble.

(See the collection of the Royal Museum of Florence.)

**155.—2078. ALBIANI - TOMEI, FRANCESCO, Seravezza.**

Marble slabs for flooring.

**156.—116. VINCENTINI, CAV. PIETRO, Rieti (Perugia).**

Coralline breccia, spotted, from Mont Alviano, near Rieti  
Yellow spotted breccia, from the same place.

#### STALAGMITIC LIMESTONE.

#### 157.—91. PONTICELLI, GUGLIELMO, *Grosseto*.

Stalagmitic limestone, called alabaster, from the farm of Alberese, near Grosseto.

This rock is found in small veins which are rarely worked. A great quantity of it has been employed in the ornamentation of the cathedral of Grosseto. It takes a high polish, and is of an agreeable aspect, in addition to possessing great hardness and power of resisting change of temperature.

#### SERPENTINES.

#### 158.—1167. BACCI, FEDERICO, *Impruneta (Florence)*.

Urn with ornaments.  
Vase with handles.  
Do. for flowers.  
Basket for flowers.  
Corinthian capital.  
Cornice, with.  
Do. without.  
Ornamented cornice.  
Console with foliage.  
Do. without foot.  
Plain polished console.  
Small column for a terrace.  
Foliated ornament for.  
Greek ornament.

#### 159.—132.\* CAPORALI, MRS. TEODORA, *Florence*.

Several specimens of rough and polished serpentinous rocks from the quarries near Colle Salvetti.

In the article on serpentines, the fine quality of the products of these quarries has been noticed. They are sold at 4s. per palm, or £12 16s. per cubic metre.

#### 160.—48. GIOVANNINI, BROTHERS, *Carmignano (Florence)*.

Table of serpentine from Monferrato, near Prato, cut and polished.

#### HARD STONES.

#### 161.—23. COCCHI, BROTHERS, *Florence*.

Jasper from Giarreto Pontremoli.

These quarries are not usually worked, but blocks of a similar size to those exhibited can readily be obtained if required.

#### 162.\*—141. NOCITO, GAETANO, *Cagliari*.

Agates from the mountains of La Quisquina, in Sicily.

The agates of Sicily are much esteemed, and are in great demand for carved and mosaic works.

#### 163.—63. MAFFEI, Cav. NICCOLO.

Calcedony from Monte Rufoli.

Slab of calcedony measuring 56 inches by 39 inches.

These have already been noticed in the article on the hard stones of the Museum of Florence, at page 58.

#### 164.—75. MESSINA (SUB-COMMITTEE).

Various specimens of marbles, lignites, and stones.

#### 165.—2073. MILAZZO (LOCAL EXHIBITORS' COMMITTEE).

A collection of hard and soft ornamental stones.

#### MASSIVE ROCKS.

For stone cutting and building purposes, see § 6, 7, 8, 9, 10, of the *Florence Natural History Museum Collection*, page 60.

#### 166.—7. BELTRANI, GIUSEPPE, *Trani (Terri di Bari)*.

Calcareous tuf.

#### 167.—18. CAGLIARI (SUB-COMMITTEE).

Sixty specimens of building stones.

- 168.**—20. CHIAVARI (ECONOMICAL SOCIETY OF).  
Collection of slates from Lavagna.  
For a notice of these slates, see page 61.
- 169.**—124\*. CRIVELLI, CARLO, *Tortona*.  
Rough and polished slabs of stone, from Sorli, in Garbagna.
- 170.**—127\*. D'ERCHIA, ANGELO, *Monopoli (Terra di Bari)*.  
Calcareous rock, from the park of Tucci and San Oronzo. Sold at 3s. per cubic metre.  
Tufaceous rock. Price 2s. per cubic metre.
- 171.**—36. D'URSO, FRANCESCO PAOLO, *Salerno*.  
Building stones, from the quarries of Paterno, Castellabate, San Mango, Eboli, and Carife.
- 172.**—44. GANNA, SEVERINO, *Turin*.  
Slabs of gneiss, from Luserna, Pignerol.  
This rock can be obtained in masses of about 250 yards cubic contents, 10 by 10, by 2½ yards, at the price of about 5s. per cubic yard.
- 173.**—70. MASSERANO, GIUSEPPE, *Biella (Novara)*.  
Rough and dressed syenite, from the quarry of La Balma, in Quittinga, near Biella.  
The annual produce is about 2,000 cubic metres, which are sold at prices varying from 40s. to 64s. per cubic metre.
- 174.**—2092\*. SCACCHI, DOMENICO, *Gravina (Bari)*.  
Samples of stone.
- 175.**—105. SERRA, LUIGI, *Iglesias (Cagliari)*.  
Granite of Arbus.  
" Guspini.  
Trachyte of Carlo Forte.
- 176.**—107. SPANO, LUIGI, *Oristano (Cagliari)*.  
Limestone and other building stones.  
Red quartose and refractory sand.  
Pozzolanas.  
Clay for bricks and pottery.  
Cellular lava.
- GRINDING AND POLISHING STONES,  
SAND AND EMERY.
- 177.**—6. BARBA TROYSE, GIUSEPPE, *Genoa*.  
Jaspideous sand from Rochetta and Beverone.  
Umber earth from Este.
- 178.**—13. BOUGLEUX, F., *Leghorn*.  
Millstones of quartz rocks.
- 179.**—37. FERRATA AND VITALE, *Brescia*.  
Millstones.  
Whetstones.
- 180.**—71. MASSOLENI, MARIANO, *Genoa*.  
Millstones built up at Genoa from pieces of French burr stones.
- 181.**—60. JERVIS, W. P.  
Hone stone from Monte Sagro, near Carrara.
- 182.**—113. VELLANO, SECONDO, *Turin*.  
Emery and glass paper.  
Emery covered leather for polishing.

## CLAYS AND REFRACTORY SUBSTANCES.

Clays suitable for the manufacture of earthenware are very abundant in Italy. Many potteries which have existed on the same sites from a very remote period are employed in the manufacture of the common kinds of ware for domestic purposes. Throughout Tuscany and the neighbouring provinces, the large oil jars called *orci*, garden pots, and similar coarse articles made from the clay of Impruneta, are much prized, owing to their durability and power of resisting frost.

China clay and other refractory substances are less common. A large mass of China clay has, however, been recently discovered.

At the last Italian Exhibition, the clay from Sano, near Volterra, was found to be the best of the refractory materials exhibited, as it was the only one capable of withstanding a heat equal to the melting point of steel without alteration.

Among the refractory rocks, that of Cardoso (Seravezza) deserves to be specially noticed. The quarry producing it is the property of an Elba iron mining company. A similar kind of stone is found in other places in the same neighbourhood, as for example at Monte Retignano, where there is a quarry which is occasionally worked. The price of the rock at this place, which is  $5\frac{1}{2}$  miles from the sea, and 5 miles from a railway station, is 20s. per ton.

On the flanks of Monte Amiata a number of small basins are found, containing a white powdery substance of a highly siliceous nature, called fossil flour, which, when examined by the microscope, is found to consist entirely of the remains of diatomaceæ and other important organisms. Several attempts have been made to use this substance for the manufacture of tiles and refractory bricks, but the incoherent nature of the material causes the article to crumble rapidly into dust. A certain amount of cohesion may be obtained by an admixture of clay, but this is attended with an increase in the weight, and diminution in the power of resisting high temperatures. The articles made out of the pure fossil flour are sufficiently light to float on water.

Mr. Santi has tried to use it in the preparation of colours, an application which may, perhaps, be of value in the manufacture of smelts and glazes; he also prepares floating refractory tiles by covering them with a peculiar kind of glaze.

The fossil flour may be advantageously used for grinding and polishing metals instead of emery.

**183.—64. BECCHINI, MAGGI, SANTI, Montalcino (Sienna).**

Fossil flour, from Monte Amiata.

Tiles made of fossil flour.

                    "                    "                    " mixed  
                    with clay.

Colours obtained from fossil flour.

Blocks of fossil flour prepared for  
polishing metal.

Mr. Santi is the inventor of the method of making colour from fossil flour, as has already been stated.

**184.—8. BELTRAMI, Count PIETRO, Cagliari.**

Refractory clay, from Gonnesa.

**185.—137\*. LICATA (MAYOR OF) (Girgenti).**

Limestone containing magnesia.

**186.—66. MALMUSI, Cav. CARLO, Modena.**

Compact argillaceous earth (figulina).

Calcareous earth (biancana).

**187.—87. PELLICCIA, LEOPOLDO, Naples.**

Felspar, of Parghelia, near Monteleone.

Fire clay.

**188.—92. QUARTAPELLE, RAFFAELLO, Teramo.**

Clay.

**189.—99. SANTI, CLEMENTE, Montalcino (Sienna).**

Fossil flour in the raw state, from Monte Amiata.

Bricks, tiles, and slates made from fossil flour.

Bricks, tiles, and slates made from the same flour.

Bricks, tiles, and slates mixed with clay.

Colours from fossil flour.

Articles made from fossil flour rendered impermeable by glazing.

Fossil flour moulded into shapes for cleaning metal.

**190.**—2116. **TORRISI, MICHEL-ANGELO**, *Treccastagne*.

Clay, from Regalbuto, used in making cream of tartar.

### EARTHY COLOURING MATTERS.

The extraction and preparation of coloured earths is a branch of industry of special interest to the painter, as the colours of this kind are remarkable for their stability, a fact that is well seen in many pictures by the old masters.

Several deposits of coloured earths are found in the Val di Magra, in the island of Elba, but they are more especially worked in the neighbourhood of Sienna, which is the chief seat of the colour manufacture. Mr. Carlo Corbi, of Sienna, exhibits a series of brown, red, and yellow coloured Siennas, both in the raw and manufactured states.

About six hundred weight of colours are annually produced.

**191.**—25. **CORBI ZOCCHI, CARLO**, *Sienna*.

Collection of Sienna colours in the raw state, and prepared for painting.

Yellow bole, in pieces.

Dark-coloured bole, calcined.

Ground bole made into cakes.

Purified bole, yellow.

Burnt do. do.

Colours obtained from these earths.

**192.**—64. **MAGGI, SANTI, AND BECCHINI**, *Montalcino (Sienna)*.

Brown bole, from the quarry of Arcidosso.

**193.**—54. **GUIDOTTI, FELICE**, *Lucca*.

Umbrian earth (brown umber).

### MARLS AND OTHER MINERAL FERTILISERS.

The process of improving land by means of marl and other mineral manures might be extensively applied in various parts of Italy. It is therefore useful to call attention to the efforts of the few persons who have already adopted it, and are endeavouring to extend its use to their neighbours' land.

**194.**—78. **BIANCHI (AGRICULTURAL INSTITUTE)**, *Modena*.

Soil from graveyards, rich in nitrogen and phosphates.

Argillaceous marl.

Calcareous marl.

Soil on which the *Pollinia Gryllus* grows, the roots of which are used for making brooms.

Graveyard soil, containing phosphorus and nitrogen.

**195.**—126.\* **DEL GRECO, FRANCESCO**, *Arezzo*.

Argillaceous and sandy calcareous marls for the improvement of lands.

Sandy and calcareous marls.

Sandy argillaceous marl.

Calcareous and argillaceous marl.

Argillaceous marl.

**196.**—2085.\* **REGGIO (EMILIA) (AGRICULTURAL SOCIETY)**.

Calcareo-argillaceous marl of Bibiano, near Reggio.

Several samples of earth from the cemeteries of Sampolo, Campogino, Brescello, Arceto, and other parts of the district of Brescia.

## CLASS II.

### CHEMICAL SUBSTANCES AND PRODUCTS, AND PHARMACEUTICAL PROCESSES.

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#### Classification.

1. CHEMICAL PRODUCTS PROPER.
  2. SALT.
  3. MINERAL WATERS.
  4. PHARMACEUTICAL PREPARATIONS, ESSENCES, AND PERFUMERY.
  5. EXTRACT OF LIQUORICE.
  6. MISCELLANEOUS ARTICLES.
- 

#### INTRODUCTORY REMARKS.

The small number of the exhibitors of chemical products is sufficient to prove that this particular branch of manufactory industry is in a somewhat backward state in Italy. The cause of this inferiority is partly to be accounted for by the vexatious restrictions imposed on the internal commercial intercourse of the country by former rulers, which have not been sufficiently long removed to allow of their injurious influences being entirely unfelt by the commercial classes.

Another, and perhaps more unfavourable circumstance, is the absence of the manufactories which in other countries are the largest consumers of chemicals, for it will be seen that the most flourishing establishments are those which are engaged in the production of articles which are taken directly by the general public.

The principal place is held by sulphate of quinine, which is manufactured on a large scale in many Italian towns, more especially at Genoa, Leghorn, and Milan. The manufactory established at Genoa several years since, by Messrs. Dufour Brothers, is justly celebrated for the purity and excellence of its productions.

Next in point of importance, we may mention the manufacture of stearine candles, in which branch the house of Lanza Brothers, of Turin, holds the foremost place.

Certain chemical products are peculiar to the soil of Italy; the most important of these is the boracic acid of the Tuscan Maremma, which is exhibited by the heirs of the late Count Larderel and Mr. Duval, of Leghorn. It will not be necessary here to describe in detail the simple and ingenious process introduced by Count Larderel, who may be justly considered as the creator of this manufacture.

The process, which consists in removing the boracic acid from the steam jets of the *soffioni*, by causing them to stream into basins of water, which, when sufficiently charged with boracic acid, is evaporated in long leaden tanks placed low down in the ground, and heated by the other *soffioni*, will be found fully described in the principal chemical text books. Messrs. Larderel are the proprietors of seven different establishments, the oldest one being that of Monte Cerboli, which employ more than 250 hands, who receive on an average about 3s. per day each. The annual production is about 2,100 tons, an amount which is constantly increasing.

The production of boracic acid in Tuscany has of late years been further augmented by Mr. Duval, of Monterotondo, where the lake of that name is saturated by natural *soffioni*, and others which have been procured artificially by boring a process which was first suggested by Messrs. Gazzeri and Manteri, and which is almost always successful, provided that the borehole is sunk to a sufficient depth.\*

The production of salt can also be abundantly increased, owing to the great length of coast available for establishing salt pans, and the presence of large deposits of rock salt.

Tartaric acid and cream of tartar are among the most important of the exports of the kingdom; and the provinces of Calabria produce the essences of bergamot, orange, and lemon, in sufficient quantities to supply the whole of Europe.

It may reasonably be expected that many branches of manufacturing chemistry which are now neglected in Italy, are likely to become of considerable importance at some future period. Among these we may instance the manufacture of sulphuric acid from the sulphur of Sicily, of soda from salt, obtained both from sea-water and the interior of the earth, and the extraction of oils from different animal and vegetable substances, which are abundant in the country.

One of the most important hindrances to the development of this class of manufactures in Italy is the scarcity of wood and total absence of coal; but, on the other hand, it must be remembered that the numerous deposits of peat and lignite furnish a material which may, within certain limits, especially where great heat is not required, be regarded as the equivalent of the more perfect fuels.

## § 1. CHEMICAL PRODUCTS PROPER.

### ACIDS.

197.—150. ALBERTI, F., *Naples*.

Collection of chemical products.

198.—534 bis. CAMPISI, ALSIO,  
*Militello (Catania)*.

Citric acid.

199.—182\*. CIUTI, NICCOLO, AND  
SON, *Florence*.

Collection of photographic chemicals.

200.—186\*. DURVAL, ENRICO,  
*Monterotondo (Leghorn)*.

Crude boracic acid.

Purified do.

\* The discovery of boracic acid in sea water, or in the *lagoni* formed around the jets of boraciferous vapours of Monte-Cerboli (*fumaroli*, or *soffioni*), reaches as far back as 1777, and the days of Herfer and Mascagni. The industrial exploitation of this article, undertaken by M. Larderel from 1818, has only practically succeeded since 1829, and the produce, which was formerly 50,000 kilogrammes, has now reached to two millions. The exploitation of Monte Rotondo, by M. Durval, is of more recent date, but already in 1853 it produced 1,000 kilogrammes daily. Boracic acid is applied especially in pottery, glassware, dyeing, metallurgy, and in the making of stearine candles, and this substance has almost everywhere superseded tincal, which was brought from the East Indies.

- 201.**—187\*. FORLI (SUB-COMMITTEE OF).  
Sulphuric acid.
- 202.**—158. LARDEREL (HEIRS OF THE LATE COUNT), *Leghorn*.  
Crystallized boracic acid.
- 203.**—2110. LOFARO, BASILIO, *Reggio (Calabria)*.  
Concentrated lemon juice.  
„ bergamot juice.
- 204.**—75. MESSINA (SUB-COMMITTEE OF).  
Crystallized boracic acid.
- 205.**—170. MIRALTA, BROTHERS, *Savona (Genoa)*.  
Tartaric acid.
- 206.**—174. RIATTI, V., *Reggio (Emilia)*.  
Chloro-sulphuric acid.
- 207.**—175. SCLOPIS, BROTHERS, *Turin*.  
Sulphuric acid.  
Nitric „  
Hydrochloric acid.
- 208.**—2074. TRAVALE COMPANY.  
Boracic acid of Travale.
- CAUSTIC ALKALIS AND ALKALINE CARBONATES.
- 209.**—152. ASQUER, Cav. ANTIOCO, *Cagliari*.  
Carbonate of soda from a natural source.
- 210.**—154. CAGLIARI (SUB-COMMITTEE).  
Soda from a natural source.
- 211.**—157. CURLETTI, ANGELO, *Milan*.  
Crude potash (carbonates).  
Caustic soda (hydrate of soda).  
Crude soda (carbonate of soda).
- 212.**—185\*. DE VITA, NICCOLO, *Giffoni (Salerno)*.  
Crude potash.  
Purified potash.
- 213.**—159. FANNI, FEDELE, *Cagliari*.  
Crude soda in the natural state.
- 214.**—165. MAJORANA, BROTHERS, *Catania*.  
Crude soda.
- 215.**—166. MARINI, GIUSEPPE, *Arezzo*.  
Crude potash.
- 216.**—167. MARRA, ENRICO, *Salerno*.  
Crude potash.  
Purified potash.
- 217.**—169. MELIS, G. BATTISTA, *Quartu (Cagliari)*.  
Crude soda.
- 218.**—2112\*. MINERVINO, MAURO, *Benevento*.  
Potash in a crude state, obtained by the incineration of the tartar deposited in wine barrels.
- 219.**—155. SERVITI, PADRI, *Sienna*.  
Bicarbonate of potash, obtained from the neutral carbonate, by the action of the natural carbonic acid given off by the mineral springs of Cinciano.  
Bicarbonate of soda produced in a similar manner.

**220.**—2115\*. TARTARONE, GIOVAN BATTISTA, *Giffone, Vallepiana, (Salerno).*

Refined potash.

SALTS.

**221.**—151. ARROSTO, GIUSEPPE, *Messina.*

Citrate of lime.

**222.**—180\*. BETTANI, GIUSEPPE, *Travi (Terra di Bari).*

Cream of tartar.

**223.**—153. BOTTONI, CELESTINO, *Ferrara.*

Crystallized cream of tartar.

**224.**—154. CAGLIARI SUB-COMMITTEE.

Cream of tartar.

Sulphate of magnesia (Epsom salts).

**225.**—238\*. CONTESSINI, FELICE AND Co., *Leghorn.*

Morphine.

Cafeine (theine, garancine).

Sulphate of quinine.

Valerianate of quinine.

Acetate of quinine.

Santonnine.

Mannite.

These products are of an excellent quality, and are principally by processes, peculiar to the factory, which have been introduced by the director, Mr. Orosi.

**226.**—239\*. CORRIDI, GUSTAVO, *Leghorn.*

Sulphate of quinine.

Citrate of quinine.

Mannite.

**227.**—157. CURLETTI, ANGELO, *Milan.*

Nitrate of potash.

**228.**—183. DE BELLIS, GIUSEPPE, *Castellana. (Bari).*

Crude tartar.

**229.**—202. DUFOUR, BROTHERS, *Genoa.*

Quinine.

Cinchonine.

Quinidine.

Cinchonidine.

Quinoline.

Mannite.

**230.**—186\*. DURVAL, ENRICO, *Leghorn.*

Sulphate of ammonia.

Biborate of soda (borax).

**231.**—203. FAVILLI, GIUSEPPE, *Pontaserchio (Pisa).*

Iron reduced by hydrogen.

Proto-iodide of iron.

Proto-carbonate of iron.

Proto-citrate of iron.

**232.**—161. GASPARE, MICHELE, *Teramo.*

Cream of tartar.

**233.**—184. GENOA SALTPETRE REFINERY, director, Col. M. G. B. de Ceva Nocetto.

Refined saltpetre in different forms.

**234.**—189. LEONI, ANTONIO, *Leghorn.*

White lead.

**235.**—168. MASSEI, CAMILLO, *Giulia (Teramo).*

Cream of tartar.

**236.**—75. MESSINA (SUB-COMMITTEE).

Potash alum.

**237.**—170. MIRALTA, BROTHERS, *Savona (Genoa).*

Cream of tartar.

**238.**—171. ORSINI, ORSINO, *Leghorn.*

Crude saltpetre.

Crystallised saltpetre.

Saltpetre crystallised by agitation.

**239.**—172. PARODI, PIETRO, *Genoa.*

Cream of tartar.

**240.**—220. PELLAS, C. F., *Genoa.*

Calcined magnesia.

Liquid magnesia.

**241.**—173. PETRI, GIUSEPPE, *Pisa.*

Iron reduced by hydrogen, and preserved from oxidation by a process peculiar to the inventor.

Mr. Petri has introduced the plan of sealing up the reduced metallic iron in small glass capsules, with long necks, which are scratched across, so as to break off easily, with a clean fracture. Each bulb contains three-quarters of a grain, which is an ordinary dose. Mr. Favilli employed similar capsules of blue glass for preserving the proto-iodide of iron.

**242.**—246.\*REGGIO OF CALABRIA (SUB-COMMITTEE OF).

Fluid nitrate of magnesia, obtained from the mother liquid of salt-petre refineries.

Solid nitrate of magnesia, obtained by evaporation of the mother liquors.

**242 bis.**—2113.\*REGGIO OF EMILIA (SUB-COMMITTEE OF).

Cream of tartar.

**243.**—174. RIATTI, V. *Reggio (Emilia).*

Cyanide of aluminum and iron.

Aluminate of soda.

**244.**—227. RUSPINI, GIOVANNI, *Bergamo.*

Mannite.

**245.**—228. SCERNO, ENRICO, *Genoa.*

Sulphate of quinine.

Citrate of quinine.

White lead.

**246.**—175. SCLOPIS BROTHERS, *Turin.*

Sulphate of iron (green vitriol).

Sulphate of copper (blue vitriol).

Sulphate of copper and iron.

Sulphate of magnesia (Epsom salts).

**247.**—176. SINISCALCO, MICHAEL, *Salerno.*

Crude tartar.

Purified tartar.

**248.**—177. SUPPA AND CASOLINO, *Trani (Bari).*

Crude cream of tartar.

Purified do.

Nitrate of potash.

**249.**—2116. TORRISI, MICHEL ANGELO, *Trecastagne (Catania).*

Tartar from Boseo, Etna.

Crude tartar.

Do. first boiling.

Do. white.

## § SALT (CHLORIDE OF SODIUM).

The quantity of salt produced in Italy amounts to between 250,000 and 300,000 tons annually.

The amount furnished by each district is seen in the following table:—

COASTS OF THE ADRIATIC.	
	Tons.
Salt works of La Cervia .....	7,200
Do. Barcetta Bari .....	14,000

COASTS OF THE MEDITERRANEAN.	
Salt works of Elba, Porto Ferrajo.	16,000

SALT WORKS OF SICILY.	
	Tons.
Collegio .....	4,500
Milissolo .....	700
Trapani .....	70,000

SALT WORKS OF SARDINIA.	
Sardinian Salt Co. ....	120,000
Salt works of Sasso, Parma .....	1,500
Do. Liengro, Calabria.	500
Do. Volterra, Tuscany.	7,500

The greater part is produced from sea water, and this manufacture has made great progress in those salt works which belong to, and were formerly worked by, the State, but which have latterly been leased to private capitalists. Thus, for example, the salt works of Sardinia, which before the convention of June 23, 1852, produced only 30,000 tons yearly, are now yielding 120,000 tons, of which 70,000 tons are sold for export, at a price of 5s. 8d. per ton, free on board at Cagliari.

A great number of the other bay salt works are no doubt susceptible of a similar development, by the introduction of improvements in the manufacture for the purpose of reducing the cost of production. In addition to increased exportation, it is to be expected that the salt trade will be largely benefited by a measure which it is believed will shortly become law, allowing salt for manufacturing purposes to be exempted from excise duty.

### 1. BAY SALT.

#### *Salt Works of the Adriatic.*

#### **250.—35. DOL, BALDASSARE, Turin.**

Granulated salt of Comacchio.  
Salt ground by steam mills.  
Gray salt for making brine.

The annual production is, as has already been stated, 30,000 tons, part of which is exported by way of the Po and the Adriatic.

#### **251.—93. RAVENNA (SUB-COMMITTEE).**

Bay salt of *la Cervia*.  
Annual production 7,200 tons.

#### *Salt Works of the Mediterranean.*

#### **252.—101. SARDINIA SALT WORKS COMPANY (*Società delle Saline di Sardegna*), office at Genoa, works at Cagliari.**

Salt, three specimens.

Out of an annual production of 120,000 tons, 50,000 tons are taken by the Italian Government, and the remainder is exported from Cagliari at the price of 7 lire per ton.

#### **253.—18. CAGLIARI (SUB-COMMITTEE).**

Salt pounded, first quality.  
Do. in lumps.

#### **254.—1. ADRAGNA, Baron GIROLAMO, Trapani.**

The extensive salt pans of Trapani, which are private property, produce about 70,000 tons of salt yearly. During the past year the price has been 4s. per ton delivered on board ship.

### 2. ROCK SALT.

#### **255.—117. VOLTERRA (the Director of the Royal Salt Works), Volterra (*Pisa*).**

The deposit of rock salt from which the brine supplying the establishment of Volterra is procured, is formed of a series of beds, varying in thickness from 16 to 45 feet, which are found in the miocene rocks. The details of the annual production of the salt works of the Elba, Collegio, Milisciola, in Sicily; Salso, in Parma; and Lungro, in Interior Calabria, will be found in the table on page 74.

## § 3. MINERAL WATERS.

The mineral waters of Italy are very numerous and varied, and their importance has been acknowledged in all ages. In the earliest times many of the thermal springs were the sites of magnificent bathing establishments, surrounded by temples erected under the invocation of heathen deities, as is proved by the massive remains of the buildings that have reached down to our time. In many cases their ancient reputation has been continued, or the springs have been re-discovered, and their real efficacy, compared with the superstitious feelings of the middle ages, have made them the object of pious pilgrimages. Many celebrated physicians, among others, Ugolino de Monte Catini, Andrea Bacci, Falloppio, Mascagni, &c., have contributed largely by their writings to the knowledge of these waters, and many new springs have been discovered in recent times, since science has furnished the means of research, and eminent chemists have studied the subject.

In spite, however, of the numerous writings, both special and comprehensive, on the waters of particular localities or provinces, a complete history of the Italian mineral springs is still wanting. A work of this kind would unite great historical and scientific interest, and would be admirably adapted for the use of the patients who are in the habit of frequenting mineral springs.



**262.—196. CAGLIARI (SUB-COMMITTEE).**

Saline water from the thermal spring called *Aqua Cotta*, in the village of Villandro.

Alkaline water from a hot spring, near Sardaro.

Ferruginous water from a cold spring, near Capoterra.

Saline mineral water from near *Domus-Novas*.

**263.—197. CARINA, Cav. ALESSANDRO, Lucca.**

Mineral waters from the baths of Lucca, with their natural deposits.

**264.—250. CASTROCARO, Forlì.**

Saline iodurated water.

Ferro-magnesian water.

The waters of Castrocaro, near Forlì, in the Tuscan Romagna of former days, and quite close to the village of that name, flow over an argillaceous tertiary soil along a stream fed by several springs, which belongs to various proprietors. Since the researches of M. Targioni, of whom we have already spoken, and the application of these waters to the treatment of scrofulous diseases, a building has been fitted up for a bathing establishment at Castrocaro, which would be doubtless much more frequented if the reputation of these waters, so rich in iodine, were more generally known, and if greater facilities were afforded for access to them. Experiments have been made to utilise these waters by the extraction of iodine, and the preparation of iodium of potash.

**265.—198. COJARI, VINCENZO, Fivizzano (Massa Carrara).**

Sulphuretted water from the baths of Equi.

**266.—240. CROPPI, CARLO, Forlì.**

Mineral waters.

**267.—200. CUGUSI, EFISIO, Cagliari.**

Mineral water from *Domus Novas*.

Ditto from thermal springs at Siliqua.

Mineral water from thermal springs at Sardava.

Mineral water from thermal springs at Fordongianos.

Mineral water from thermal springs at Villacidro.

Ferruginous water from Capoterra.

**268.—204. FOTI, SALVATORE, Aci Reale (Catania).**

Mineral water from Santa Venere del Pozzo, near Aci Reale.

**269.—206. GARELLI, Dr. GIOVANNI, Turin.**

Thermo-sulphurous water of Val-dieri.

Earthy deposits.

**270.—209. GIORGINI, Dr. GIULIO, Radicofani.**

Mineral water from the baths of S. Casciano.

**271.—208. GIORGINI, Prof. G., Parma.**

Saline water containing iodine, from Sassuolo, Parma.

A memoir on the composition and uses of the waters of Sassuolo.

**272.—210. GRASSI, PAOLO, Aci Reale (Catania).**

Mineral waters, called *del Ferro*, from S. Tecla.

**273.—211. LIPARI, (LOCAL EXHIBITORS' COMMITTEE), Messina.**

Thermo-mineral waters, from San Calogero, in the island of Lipari.

**274.—212. MACERATA (SUB-COMMITTEE).**

A collection of mineral waters.

**275.—213. MADESIMO MINERAL WATER COMPANY, Chiavenna.**

Mineral water.

- 276.**—251. MAGNELLI, LUIGI, *Florence*.  
Artificial mineral water.
- 277.**—242\*. MAJORONA, GIUSEPPE, AND TORNABENE, FRANCESCO (*Catania*).  
Mineral waters, from the neighbourhood of Catania.
- 278.**—252. MONTECATINI (ROYAL THERMAL ESTABLISHMENT).  
Saline purgative thermal waters.
- 279.**—214. MONTINI, PASQUALE, *Fabriano (Ancona)*.  
Seltzer water.  
Seidlitz „  
Magnesian water.  
Ferruginous water.  
Vichy water.
- 280.**—283. (Wanting).
- 284.**—217. NOCERA (MUNICIPALITY), *Umbria*.  
Mineral water.
- 285.**—218. ORSI, AGOSTINO, *Montalcino (Sienna)*.  
Acidulous water, containing alkalies, from Collalli, near Montalcino.
- 286.**—223. POLI, GIOVANNI BATTISTA, *Brescia*.  
Pills formed from the deposits of mineral water.
- 287.**—245.\* PONDI, GIUSEPPE, *Palagonia (Catania)*.  
Ferruginous water from Avomghella, near Palagonia.  
Acidulous water from Ingalleuve, near Palagonia.  
Ferruginous water from the Valley del Cervo, near Palagonia.
- 288.**—226. REGGIO (EMILIA) (SUB-COMMITTEE).  
Saline water of Pojano, in the Apennines.
- Ferruginous water of Quare, in the Apennines.  
Sulphurous water of Dirizzano.
- 289.**—225. RIOLO (COMMUNE OF), *Ravenna*.  
Ferruginous mineral waters with their analyses.
- 290.**—227. RUSPINI, GIOVANNI, *Bergamo*.  
Thermo-mineral saline, iodurated water of San Pellegrino.  
Ferruginous water of the Carmine.  
Saline ferruginous water of S. Homo-Bono.  
Saline sulphureous water of the Val Brunone of Berbano.  
Mineral water of Torre Rovere.  
Saline ferruginous water of Fonte Boario.  
Sulpho-saline iodurated water of Trescore.
- 291.**—230. SPANO, LUIGI, *Oristano (Cagliari)*.  
Mineral waters.
- 292.**—247\*. TORRI, FRANCESCO, *Pisa*.  
Mineral water of the baths of San Giuliano, near Pisa.
- 293.**—231. TURIN (ACADEMY OF MEDICINE).  
Collection of mineral waters of the ancient Sardinian provinces.  
Mineral deposits.
- 294.**—233. VERGA, ANDREA, *Milan*.  
Mineral saline, iodurated water, discovered recently near Mirandola, Pavia.  
Memoir on the above water.
- 295.**—248. VITI, MARQUIS ANNIBALE, *Orrieto (Perouse)*.  
Acidulous water, containing carbonates of iron and manganese.

§ 4. PHARMACEUTICAL PREPARATIONS, ESSENCES AND PERFUMERY.

**296.**—194. BORTOLOTTI, PIETRO, *Bologna.*

Felsina water, white and red.

This preparation was first introduced to the public by Mr. Bortolotti, in 1827. About £2,400 worth of materials is used every year in the manufacture, and the product is in great demand, both in Italy and abroad. In addition to being an agreeable perfume, the Felsina water possesses important properties as a tonic and excitant, and is of value as an application to the skin and gums, and for the treatment of hysterics, &c.

The exhibitor has received prizes at several exhibitions, the last being the medal of the Italian Exhibition of 1861.

**297.**—181.\* CARASCO, GIUSEPPE, *Susa (Turin).*

Essence of peppermint.

**298.**—237. CASTAGNACCI, ALESSANDRO, *Florence.*

Lichen paste.

Sulphur lozenges.

Vermifuge lozenges.

**298 bis.**—239. CORRIDI, GUSTAVO, *Leghorn.*

Castor oil.

**299.**—205. GAGLIANI, AND MAZZA, *Milan.*

Castor oil.

**300.**—188\*. GULLI, GIUSEPPE, *Reggio (Calabria).*

Essence of bergamot, prepared by the old sponge process.

Essence extracted by mechanical means.

**301.**—2110\*. LOFARO, BASILIO, *Reggio (Calabria).*

Essence of bergamot.

Do. sweet lemons.

Do. cedrat.

Do. bitter oranges.

**302.**—818. MAZZUCHELLI, EUGENIO, *Turin.*

Castor oil.

**303.**—2111. MELISSARI, FRANCESCO, SAVERIO, *Reggio (Calabria).*

Essence of bergamot.

Do. lemon.

Do. sweet oranges.

Do. bitter oranges.

Do. mandarin oranges.

**304.**—746. MESSINA (SUB-COMMITTEE).

Essence of lemon.

Do. oranges.

**305.**—219. PATUZZI, LUIGI, *Brescia.*

Various preparations of essential oil of lemons.

In spite of its high latitude, the district of Salò is so favourably situated by the relative position of the Alps and the Lago di Garda, that the orange and lemon tree flourish in the open air, and it is from this district that Mr. Patuzzi draws the supplies of fruit for his manufactory of aromatic waters.

**306.**—220. PELLAS, C. F., *Genoa.*

Cod liver oil.

Mr. Pellas, of Genoa, keeps an establishment in North America, at the head-quarters of the cod fishery, where the medical oil is extracted which is sold under his name.

**307.**—221. PERI, GAETANO, *Milan.*

Anti-rheumatic oil.

**308.**—173. PETRI, GIUSEPPE, *Pisa.*

Solidified cod liver oil.

**309.**—222. PIGHETTI, A., *Salò, (Brescia).*

Citron water (see No. 304).

**310.**—223. POLI, GIOVANNI BATISTA, *Brescia.*

Sarsaparilla pills.

- 311.**—257. PRANZINI, LORENZO, *Florence*.

Chemical products for perfumery.

- 312.**—224. RICCI, GIOVANNI, *Turin*.

Digestive lozenges.  
Ophthalmic ditto.  
Tincture of peppermint.

- 313.**—229. SCOLA, BERNARDINO, *Turin*.

Sweetened gelatinous capsules, for the administration of nauseous medicines.

- 314.**—2232.\* VALERI AND Co., *Legnano*.

Castor oil.

Seeds of the black and red castor oil plant from which the oil is extracted.

Castor oil cake for burning or manure.

The cultivation of the castor oil plant is likely to prove very advantageous to Italy, but up to the present time only a small breadth of land is under this crop.

In the northern part of the country, around Legnano and Verona, it has been grown since 1816, and recently the produce both of seed and oil has been considerably increased.

Mr. Valeri owns a large establishment containing hydraulic oil presses, machines for cleaning and sorting the seed; and a particular filtering process is employed for purifying the expressed oil. About 45 tons of oil are here produced annually, from about 120 tons of seed. The cake remaining after the oil has been expressed is in great demand as a manure for hemp growers.

- 315.**—232. VERATTI, CARLO, *Bologna*.

Catechu aromatic lozenges.

#### § 5. EXTRACT OF LIQUORICE.

- 316.**—193. BARACCO, BROTHERS, *Cotrone (Catanzaro)*.

Extract of liquorice.

- 317.**—199. COMI, RICCARDO, *Giulia (Teramo)*.

Extract of liquorice.

- 318.**—201. DE ROSA, RAFFAELLO, *Atri (Teramo)*.

Extract of liquorice.

- 319.**—216. NAPLES (SUB-COMMITTEE).

Extract of liquorice.

- 320.**—243.\* PIGNATELLI, VIN-CENZO,

Extract of liquorice.

Another product, not inferior in importance to manna, is the juice or extract of liquorice-root, *Glycyrrhiza glabra*, which is prepared in Calabria and Sicily, as well as in Spain, Greece, &c. The provinces in which this plant is grown are Chieti, Fermo, Calabria Ulterior, Palermo, Termini, Girgenti, Trapani, and Catanzaro.

The quantity of extract produced from 400 to 450 tons of liquorice-root is about 80 tons, of a money value of from £6,000 to £7,000, part of which is consumed on the spot, but the bulk of it is exported to the north of Europe and America.

#### § 6. MISCELLANEOUS ARTICLES.

- 321.**—253. VITI, AMERIGO, *Volterra (Pisa)*.

Ornaments in indurated alabaster, in imitation of Florentine mosaic.

- 322.**—162. Ghibellini, DOMENICO AND VINCENZO, *Persiceto (Bologna)*.

Lacquer for iron work.

- 323.**—156. CORSINI, LUIGI, *Florence*.

Blacking for leather and boots.

- 324.**—160. FERRONI, GAETANO, *Florence*.

Blacking for boots.

**325.**—164. LODINI, BROTHERS,  
*Persiceto (Bologna).*

Lacquer for iron work.

**326.**—164. MAFFEI, GIUSEPPE,  
*Reggio (Emilia).*

Heliolene, a colourless and inodorous spirit for lamps.

**327.**—178. TOVVO, FRANCESCO,  
*Turin.*

Paste made of finely-ground coral, which may be coloured and moulded for ornamental purposes.

**328.**—179. VERCIANI, ANGELO,  
*Lucca.*

Specimens of ivory, artificially coloured.

## CLASS III.

### SUBSTANCES USED FOR FOOD, &c.

#### Classification.

##### SECTION I.

###### AGRICULTURAL PRODUCTS.

- |            |   |  |
|------------|---|--|
| 1. CEREALS | { | WHEAT.                                     |
|            |   | BARLEY, RYE, OATS, &c.                     |
|            |   | MAIZE.                                     |
|            |   | ITALIAN MILLET, COMMON MILLET, SORGHO, &c. |
|            |   | RICE.                                      |
2. VEGETABLES.  
3. FODDER AND GRAINS USED AS FODDER.  
4. DRIED FRUITS.

##### SECTION II.

###### ARTICLES SUITABLE FOR FOOD, PRESERVED OR OTHERWISE.

1. FLOUR, ITALIAN PASTE, BREAD, BISCUITS.  
2. MEAT, FISH, VEGETABLES, SALTED OR PRESERVED.  
3. CHEESE.  
4. HONEY.  
5. SUGAR.  
6. CONFECTIONARY.

##### SECTION III.

###### WINE, SPIRITS, LIQUEURS, TOBACCO.

1. WINE, ALE, ALCOHOL, LIQUEURS, VINEGAR.  
2. TOBACCO.

#### SECTION I.

##### AGRICULTURAL PRODUCTS.

### INTRODUCTORY REMARKS.

This class embraces a great portion of the productions from which the elements of the territorial riches of Italy are derived.

It is well known that the peninsula, extending about 1,033 kilometres between Cape Spartivento to the south and Mount Blanc to the north, is surrounded on three sides by the sea, by the Alps on the fourth, and sheltered by these mountains from the rigour of the north, whilst exposed to the benign influences of the south, which, radiating from the African coast, fructify the

land in their course. To these circumstances, as much as to its position, between the 36th and 47th degrees of latitude, and the 4 degs. 15 min. and 16 degs. 15 min. east longitude from the meridian of Paris, it owes its climate and the exceptional seasons which it enjoys, above all in the south, where with the summer heats much moderated, the winters are almost as mild as those on the coast of Africa. Moreover, its superficies, of about 270,000 square kilometres, is broken and made uneven in a thousand ways by the sinuosities of the mountains, the courses of the rivers, and the very unequal development of its slopes, one inclined to the east towards the Adriatic, the other on the west towards the Mediterranean.

The soil is not less varied, from the nature of its component rocks, which, without discussing their origin and their exact age, are still more diversified by the irruption of silicious, alkaliferous, and magnesian rocks of igneous formation, thereby altering the calcareous, arenaceous, or argillaceous sedimentary rocks, not only in their physical relations, but also in their chemical constitution: these sedimentary rocks far exceed in extent the primary formations.

From all this a great variety of circumstances concur in influencing naturally the products of the earth and the system of agriculture; this again being modified by various causes, irrespective of natural conditions, which have up to the present day retarded or promoted the industry of the country.

Thus, there are plains in the rich and extensive valleys, and in Lombardy especially, where the art of irrigation has been carried to a high state of perfection; the yield of the land has thus been raised in a remarkable degree.

Besides grass lands, with which cattle are naturally incidental, the principal products of Lombardy are rice, in the low-lying parts, maize, wheat, and all kinds of grain, silk, milk, and cheese. The same conditions and the same cultivation are found in some parts of Piedmont and of Emilia; but in the Bolognese, hemp acquires a considerable importance which it does not possess elsewhere, whether as regards the quantity grown or its quality. With the exception of the plains, where corn of every description exhibits a remarkable predominance, the marshes are more or less drained, and thus afford fertile fields for wheat, or for pasturage exclusively. In the rice fields, as will be seen hereafter, the production is much more varied than in the central parts of Italy, much more diversified by the broken nature of the soil, where in each place different modes of tillage are practised upon more or less sound agricultural principles. In the south, in all parts where the land is under cultivation, the production of wheat exceeds all others; the hard wheats especially are excellent, and by their quantity and their remarkably good quality yield most valuable returns.

The vine spreads gladness with its clustering fruit in whatever place it is found, provided that it does not grow in a too elevated or marshy spot.

The disease called the *crittogama*, or the *oidium*, which has rarely spared any of the vine districts, has diminished, but for several years successively in some places it almost entirely destroyed the vintage.

The olive and orange, which in the southern provinces and Sicily are almost in their native countries, are found as high northwards as Tuscany, Liguria, and in Lombardy, also on the banks of the lakes, especially on that of Garda.

There are also excellent fruits of all kinds, the quality of which is very superior in the south and in the islands.

Agriculture in Italy is in rather a backward state. It requires, above all, a more scientific division of the lands and tillage for corn and grass; a regular rotation of crops; and in fact, intelligent improvement, with a more general

employment of agricultural implements and machines, the application of larger capital, and the employment of good practical men to prepare the wines and oils; but it must not escape observation that there is a state of relative perfection at least existing in many districts, in which, under various titles, a number of practical men are found actively employed, who have anticipated the intelligence by which modern science has succeeded in the present day in elucidating sound principles.

By its topographical constitution Italy cannot in a great degree profit by systems of high farming, which nevertheless is carried on in several localities, upon the principle of a stipulated fixed annual rent; but the *métairie* (*mezzeria*) system is generally adopted in the country, and forms the basis upon which the great agricultural interests are regulated.

## § 1. CEREALS.

### WHEAT.

It is usual to distinguish the wheats of the spelt kind, and, amongst the first, to distinguish certain types which form varieties and natural species.

There is thus the hard wheat (*Robus* of the ancients, *Triticum durum*, Desf.), *gran duro*, *grano sicilio*, *grano da pasta*, *grano de semolino*, called also *grano farro* in Sicily, although the *Farro* is truly a spelt wheat. The descriptions and varieties of this numerous but distinguishable species of wheat abound, especially in the southern parts, and are an essential product of Apulia and Sicily, as well as of some parts of Sardinia; their growth is altogether limited in the most fertile parts of the middle provinces and of the north.

Under the name of *soft wheat* (*grano tenero*, *Siligo* of the ancients) are comprised generally the different varieties which are included principally under the name of *Triticum vulgare*, Villars; *T. sativum*, Lamarck, of which Linnæus has made two species (*Triticum hybernum* and *Triticum aestivum*).

The varieties are with or without the ears bearded, white or red, smooth or villose; and these descriptions of corn are known commonly under the name of *grano gentile*, *Tosello*, *Calbigia*, etc., or of *grano grosso*, *grano commune*, *grano nostrale*, *grano sarnese*, *grano ravanese*, *grano di Barberia*, *grano Mazzocchio*, *Mazzochino* (*Triticum turgidum*, L.), of which the ears vary from the simple ear to the compound, for instance, in a form which has been considered that of a particular type (*Triticum compositum*).

The production of these last kinds of wheat is the most extensive in Italy, but they are almost always unequally distributed according to the different localities.

The soft wheats of the first category sell at a higher price, and are more in demand for the manufacture of flour and fine bread, whilst the others are used for more ordinary purposes, either unadulterated or mixed with the first sorts.

The Polish wheat (*Triticum Polonicum*) is only cultivated in exceptional cases.

The spelt wheats (*Triticum Spelta*, L.), *Granofarro*, are frequently cultivated in the provinces of the north, and the true spelt wheat must not be confounded with the hard wheats of Sicily; as stated above, they are denominated *grano farro* in the places of growth.

Amongst the spelt wheats are distinguished starch wheat (*Triticum amyleum*, Seringe) and the *Triticum monococcum*, which is also called *piccolo farro*.

The land for the cultivation of wheat—produced by regular biennial and triennial crops, but more rarely at very distant periods and very often irregular—is commonly divided into longitudinal furrows. Sowing, reaping, and threshing are performed by hand-labour; the latter operation only facilitated by animals. Women reapers and threshers are of recent introduction, but their employment is not general. The first reaping machine constructed in Italy was at Melegnano, by M. Pietro Onesti, under the supervision of M. Ridolfi, the celebrated writer on agriculture.

A number of circumstances and local practices make a variation in the proportion of seed to the land of from 1·80 to 2·80 hectolitres to the hectare.

The produce of ordinary soil may, under common circumstances, be estimated at from 15 to 27 hectolitres, which is about a middle term between that of France and Algeria.

The weight of wheat is from 78 to 85 kilos. per hectolitre (CANTONI, *Trattato completo di Agricoltura*), at least as regards the soft wheat (M. RIDOLFI).

In order to be profitable to the producers, the cultivation of wheat ought in Tuscany to

increase in the ratio of six for one seed, a yield which is obtained and even exceeded without manuring in certain localities, and in land which has been lying fallow, but which is not otherwise reached without the aid of abundant manure.

The cultivation of wheat is very extensive, and is often kept up even where it is not profitable. The quantity produced, according to the census, reached 36,000,000 hectolitres; but it is nevertheless not equal, on an average of years, to the consumption. Owing to the small quantities grown in certain localities, a very considerable inland trade springs up, as well as an importation of wheat and flour from Russia, Egypt, and America. Certain descriptions of Italian wheat are however exported, on account of their excellent quality.

A free-trade in corn has been in Tuscany a fundamental principle in political economy, which is accepted now in other parts of the kingdom; but there still exists in the provinces administered by other governments, restrictions which fetter industry and commerce under the pretext of protection.

#### BARLEY, RYE, OATS, ETC.

In Italy there are cultivated:—

1st. The different varieties of the common barley (*Hordeum vulgare*, L.).

2nd. Winter barley (Orzola sei canti) (*Hordeum hezasticon*, L.).

3rd. Pearled or German barley (*Hordeum Zeocriton*, L.); sprat or battledore barley, German barley.

4th. Long-eared barley, orge pamelle (*Hordeum distichon*, Linn.) (Orzola or Scandella); it ripens at the end of six or even three months.

5th. Rye (*Secale cereale*, L.), with some varieties of winter and summer sorts.

6th. Oats (common) (*Avena sativa*, L.), distinguished as winter and spring oats by peculiar character of vegetation, by external properties, and by the fruit, &c., into black oats, patata oats (*Vena patata*).

7th. English oats, the variety of *Avena nuda*, L., and amongst them that of Tartary, *Avena tatarica*, Arduino.

9th. The varieties of *Avena orientalis*, Schreber, amongst which are the Russian, the Hungarian, and the clustering oats.

10th. Canary seed, bird seed (*Phalaris canariensis*, Linn.), is of some importance in estimating the cereal products of Italy.

The position and the nature of localities determine the choice of the products above indicated, so that rye is cultivated in the light and sandy soils and in elevated places; barley in the high lands; oats in all parts in poor soils; but not unfrequently they are found proximately to each other, and with wheat or vegetables, either intermingling wheat with rye, or oats with rye; otherwise, in particular proportions, they enter into the system of rotation crops, and are also cultivated for fodder.

The yield and weight of the above is thus estimated:—

	General Production by hectolitres.	Production by hectare.	Weight by hectolitres in kilogrammes.
Rye .....	3,186,000	37 to —	73 to 80
Barley .....	2,340,000	22 „ 25	60 „ 70
Oats .....	750,000	36 „ 45	44 „ —

Rye and barley are used, like wheat, in the making of bread; but their flour is usually mixed for this purpose with wheat flour or vegetables. They are also used both ground and unground for feeding horses.

Barley is employed in the brewing of beer, and, like other cereals, in the manufacture of alcohol, particularly in the southern provinces.

Buckwheat (*Fagopyrum esculentum*) is of importance in the alpine countries of the Valtellina, where its production nearly equals that of maize, and is three times larger than that of wheat.\*

#### MAIZE, OR INDIAN CORN.

Maize (*Zea mays*, L.) Formentone, or gran turco, gran siciliano, and in Lombardy, Melgone, was probably imported from the coast of Spain into Sicily, and possibly into Tuscany, between the years 1553 and 1594, if we give credit to the reports of Faselli and Carletti, the Florentine travellers, and of Hernandez, who in 1600 expressed surprise that

\* Visconti Venosta—"Notizie Statistiche sulla Valtellina, 1844.

the Spanish cultivators had not at that time introduced it. It was known at a late period in the Bolognese (1602) and after 1610 in Friuli.\*

Maize was substituted in Lombardy for millet as well as for oats, barley, and even wheat itself, when it had the advantage of a soil on the plains and of irrigation. The produce of the irrigable lands was thereby much increased, to the great benefit of the rural population, in fact of the whole agricultural interests of the country.

There are numerous varieties of maize; early maize, chicken maize, quarantine maize (*granturco quarantino*, *sessantino*, *ottantino*, *granturco agostano o di estate*) and later or autumn varieties (*granturco tardivo*, *granturco di Pensilvania*, *Virginia*, *Filadelfia*); varieties of yellow, white, red, and brown seeds; varieties with full ears, or with ears empty at the two extremities; varieties with ears of six, eight, or more rows, with the ears simple or branching, the seed naked or husked, giant and dwarf.†

According to known data, the produce of maize exceeds by a full third that of wheat in the province of Cremona, and two-thirds in the Valtelline. It is nearly three-eighths of that of wheat in Liguria, a little less than one-half in the Bolognese, one-tenth in Calabria Ulteriore, and one-fiftieth in the Capitanata.

The gross return by hectare is thus given for Lombardy:—

Maize, late growth .....	80 hectolitres.
Do. summer .....	50 do.
Do. quarantine .....	20 do.

The weight of the hectolitre varies from 68 to 70 kilogrammes (Cantoni).

The uses which maize subserves are very numerous, whether as semola, or as flour for making polenta, which has been consumed especially by all the rural population in Lombardy since the end of the last century. This valuable corn is subject to the mould, which is produced by the generation of the *Sporisorium maydis*; and many persons attribute to this alteration in maize, and not to the nature of the grain itself, the "*pellagra*," or, to use a metaphorical expression, the "poor man's disease," which in France as well as in Italy follows the production of maize whenever this corn has been used almost exclusively as the main article of food.

#### ITALIAN MILLET, COMMON MILLET, SORGHO, ETC.

The above, as well as barley, rye, and oats are allied to wheat, by the conditions of their cultivation when reclaimed from their natural characters. Italian millet (*Panico*) (*Panicum italicum*), the common millet (*Miglio*) (*Panicum miliaceum*), the various species and varieties of *Sorghum* (*Saggina*, *Meliga*) (*Holcus*) are allied to maize. Amongst them the most important, under the names of *Saina*, *Sainella*, *Meligo*, *Sorgo*, are the varieties of the common Indian millet, common *Sorghum*, *Sorghum vulgare*, with white or red flowers, the last being the earliest raised, and those cultivated by preference in Lombardy. Other distinct species also exist, most often represented by local varieties, such as the *Saggina da granate*, or *Saggina scopajola*, *Sorgho* (*Sorghum saccharatum*), the *Saggina bianca*, compact Indian millet (*Sorghum compactum*), the *Saggina di Caffreria*, Caffrarian millet (*Sorghum caffrum*), introduced by Arduino, in 1775,‡ and lastly the Chinese Sorgho, sugar Sorgho (*Sorghum glycichylum*, Passerini), which furnishes fodder from its leaves, bread from its grain, and sugar or alcohol from its stalk.

The peeled millet is used in small quantities for cooking. With the husk on it is used with the millet of Italy to feed birds.

The sugar sorgho (*Sorghum glycichylum*, Passerini) seems to be more specially used in the preparation of syrups and alcohol, whilst its leaves and seed would make excellent fodder. Experiments have been made to extract colouring matter from the husks.

The produce by the hectare is thus estimated in Tuscany:—(Ridolfi.)

Saccharine matter, 508·70 kilogrammes, of which from 23·73 to 50° is alcohol.

Stalks, from which the saccharine matter has been extracted, 508·50 kilogrammes.

Fresh fodder, 610·20 kilogrammes.

Ripe grain, 8·57 hectolitres.

#### RICE.

Rice, when first imported, doubtless as an article of merchandise, was cultivated perhaps in Sicily in the 9th century, and introduced into the rest of Italy only in the 15th and 16th

\* Antonio Targioni Tozzetti, "Storia della introduzione di alcune piante in Toscana."

† The late Professor Brignoli, of Modena, collected a great number of varieties and materials for a monograph on this cereal; the specimens may be seen in the Exhibition.

‡ Ant. Targioni Tozzetti, *Notizie storiche sulla introduzione di diverse piante*.—Firenze, 1855.

centuries. It was found amongst the products of Mantua in 1481, of Novara in 1521, in the Veronese in 1522, and its cultivation is connected there with the name of Théodore Trivulzi, of Milan, who commanded the armies of the republic of Venice. Giovanni Targioni Tozzetti, of Florence, a naturalist, agriculturist, and learned physician of about the end of the 18th century, quotes, nevertheless, a manuscript of 1468, being a petition relating to the use of some waters in the plain of Florence, submitted by a person named Leonard di Colto, with the object of establishing rice fields. Francis I. of Medicis, and Ferdinand I., in their time, and afterwards the inhabitants of Lucca from the commencement of the last century, and lastly speculators in our own time, have attempted the cultivation of rice in Tuscany and in the territory of Lucca with more or less success, although the soil adapted for these undertakings confine them to a small extent in the countries near the sea coast between the Magra and the Serchio.

Piedmont, Lombardy, Emilia cultivate rice on a large scale in permanent or temporary rice grounds, which last from two to three years, and occupy from one-fourth to one-half of the arable lands, but more commonly one-third only; so that, in the rotation of crops, one crop of rice is usually raised between two crops of maize, both being produced without manuring.

Rice requires for sowing 1.45 or 2.00 hectolitres per hectare, according to the varieties, the nature of the land, and the year of the rice-field. The manure used for these rice grounds is fresh earth, which has not been exhausted by preceding irrigation or cultivation of rice. After sowing, the weeding and drying of the rice grounds must be attended to. The reaping is done by hand, and the thrashing by horse-power or by machines recently introduced.

The varieties of rice cultivated in Lombardy are distinguished by the duration of the vegetation and by the character of the fruit and the plants. They are reduced to the rice of the country, *riso nostrale*, *riso di Ostiglia*, *riso novarese*, *riso Franconi* (*Oryza sativa*, L.), which grow from April to September; to the *Oryza denudata*, to which is allied the *mellone*; the growth takes place from March to August, or rather from May to September.

The provinces of Brescia and Cremona produce rice to the extent of more than one-tenth of their produce in wheat; the Bolognese produces one-fiftieth part; as regards the province of Pavia, all its cereal wealth consists of this produce, which is more than four hundred thousand hectolitres.

Rice with its husk on (*risone*) is passed through the *pista*, a very imperfect machine, which cleans it, that is to say deprives it of its covering; it is afterwards bleached, which operation is now managed by means of a brush specially invented for the purpose, made of a hempen cloth. (See Class 19). The following table exhibits the growth of rice:—

CULTIVATED VARIETIES.	Year of the establishment of the rice ground.	Rice with husk, hectolitre.	White Rice, by hectolitre of husked rice.	Weight of hectolitre of husked rice.
Indigenous.....	1st	40	0.40 to 0.45	50 kilos.
" .....	3rd	20		
Mellone .....	1st	90 to 110	0.45 to 0.50	54 kilos.
" .....	2nd	60 to 70	50	69 "
Novara .....	2nd	90 to 110	0.40 to 0.45	43 to 48.

The price of rice is kept up at about double the rate of wheat. A very important commerce is carried on in this article with those Italian provinces which are deprived of it, and also with foreign parts. In 1858 the exportation of rice rose, as regards the ancient provinces of the kingdom, to 285,275 quintals, whilst wheat scarcely reached 211,212 hectolitres, against an importation of 1,679,488 hectolitres. Rice yields a profit equal, or even above, that which is obtained by silk, particularly in Piedmont.

Rice is used for cooking, or for flour.

The cultivation of rice is alleged to have a pernicious influence upon the sanitary state of the country; and certainly it does not conduce thereto to establish a rice-field in any locality whatever, even if kept up by well-observed regulations respecting irrigation and the course of the waters; but when investigating the causes of disease, or the decrease of population observed near certain rice fields, we must keep in view the natural features of the locality and the nature of the labour carried on in it, which perhaps permits the working classes to reside at a distance from rice fields.

In Italy there has been a necessity, long felt, to know closely, by means of observation, and by direct and continued analyses, the composition of the products of the land, not only to obtain thereby speculative notions, but also to deduce practical information with reference to

the products themselves. In order to furnish corresponding special reports of a certain number, at least, of the products exhibited, the Royal Commissioners of the London Exhibition proposed to a committee of distinguished chemists in Florence, a formula of analysis to regulate, upon a uniform system, each series of agricultural products, and invited the sub-committees to adopt the same course with respect to the chemists of other provinces, in order to obtain similar information with regard to the productions of the various localities.

To M. L. Guerri, professor of the chemical works of the School of Pharmacy of Florence, and to the active and intelligent co-operation of the pupils, Messrs. G. Berti, of Florence, A. Gregori, of Padua, and T. Porcelli, of Roccalbenga, we are now indebted for the analyses set forth in the following table, which are not pretended to be complete analyses, but quantitative determinations capable of comparison with each other, the process by which they have been obtained being identical, and relating to certain chemical components in cereal grain, those components being indicated of which the presence and the amount are capable of affording the most practical information.

All these determinations have been taken upon the flour with the bran mixed together, the substance being operated on without any previous drying process whatever. The proportion of water has been determined by comparison after drying at 140°; the inorganic substances are estimated by the residuum of the calcination, after re-integration of the carbonates by means of carbonate of ammonia; the soluble substances are treated by taking the differences after diffusion in water, and dessication of the residuum; the starch, by means of diastase, operating upon the residuum itself, and by a new difference of weight; the gluten with the fatty matters by repeated treatments with a lye of potash, water, acetic acid, ether, alcohol; woody substances by weighing direct the final residuum of the preceding operations.

## ANALYSIS OF VARIOUS KINDS OF ITALIAN GRAIN AND FLOUR.

By M. Luigi Guerri, of Florence.

N <sup>o</sup> .	NAMES OF THE PRODUCTS AND THEIR DERIVATION.	Weight of one Litre of matter.	Water per cent.	Ash per cent.	Soluble matter per cent.	Starch.	Starch and soluble matter.	Gluten and fatty sub- stances.	Woody matter.
		gr.							
1	Soft wheat ( <i>Calbigia bianca</i> )— Plains of Arezzo ... ..	842.700	14.000	2.200	5.608	54.947	60.555	15.845	9.600
2	Soft wheat ( <i>Calbigia rossa</i> )— Plains of Arezzo ... ..	825.440	14.600	1.900	4.866	53.062	57.928	18.392	10.080
3	Soft wheat ( <i>Civittella</i> )—Bolgheri. Grano gentile ... ..	811.900	11.700	1.200	...	...	73.354	8.166	6.780
4	Soft wheat ( <i>Campio</i> )—Farina ...	833.940	11.690	1.500	...	...	72.410	9.480	6.420
5	Soft wheat ( <i>Campio</i> )—Farina ...	688.000	14.100	0.720	2.250	63.894	66.144	14.216	5.540
6	Roman wheat—Farm of Fossa Sambra ... ..	665.900	13.500	1.000	3.820	60.240	64.060	14.402	8.038
7	Hard wheat—Plains of Arezzo ...	840.570	13.600	2.000	6.655	48.560	55.215	18.685	12.500
8	Bus wheat—Cagliari ... ..	809.400	13.630	1.800	6.293	51.396	57.689	18.235	10.445
9	White wheat—Capitanata ... ..	793.870	14.801	1.700	4.615	56.400	60.915	16.677	7.607
10	Red wheat (Cagliari) ... ..	799.880	13.502	1.620	5.520	52.878	58.398	19.420	8.680
11	Mixed wheat—Plains of Arezzo ...	797.880	14.530	1.900	5.664	52.006	57.670	19.300	8.500
12	Barley—Cagliari ... ..	586.200	14.005	2.320	3.308	53.172	56.480	12.720	16.800
13	Chenopodium Chinosa ... ..	830.600	11.310	3.500	...	...	67.528	11.402	9.560
14	Morelle oats—Bolgheri ... ..	525.500	10.090	8.000	...	...	49.270	21.140	19.500
15	Common barley—Bolgheri ... ..	598.356	10.810	2.600	...	...	57.410	18.180	13.600
16	Rye—Plains of Arezzo ... ..	669.180	13.600	1.700	5.042	55.218	60.260	16.042	10.098
17	Maize—Fossa Sambra ... ..	694.080	14.600	1.000	5.842	58.758	64.600	11.160	9.640
18	Maine ditto ... ..	721.120	13.300	0.700	...	...	65.140	12.720	8.044
19	Indian millet ... ..	660.180	14.600	3.200	1.626	54.154	...	16.518	13.102
20	Millet—Province of Arezzo ... ..	667.100	13.480	4.300	2.040	58.880	60.920	20.800	4.800
21	Rice (flour) ... ..	700.500	14.900	1.020	1.626	71.660	73.286	...	...
22	Chestnuts (flour)—Mountains of Lucca ... ..	549.520	11.100	1.900	21.950	52.148	74.098	7.202	7.600
23	Chestnuts (flour)—Plains of Lucca.	548.500	12.500	2.900	19.048	52.608	71.656	7.644	8.200

Flour has been digested in four times its weight of water and agitated; the substances dissolved in the clear solution are allowed for in the total quantity of the liquor employed; amongst these substances have been found the principles of azote and sugar in varying quantities.

Gluten, by the method employed, is perhaps above the ordinary average.

The results of the process in the starch have been treated in the same manner, so as to allow for the specific quantity operated upon, and the concentration of the solvents employed.

As regards the analysis of M. Guerri, we must remark that perhaps the process laid down beforehand, which had for its object to secure an uniform and sufficiently expeditious mode of proceeding to be within the scope of every chemist, tends to raise the collective amount of the substances combined with azote and the fatty matters, and does not go so far as to report correctly either the nutritive power of the articles examined, or their abundance of azote. For this reason, M. Guerri has determined the quantity of azote separately, and afterwards estimating it at 15 per cent. of the quantity of albuminous substances, a sensible diminution results, which brings the calculation pretty near the ordinary averages.

We here give other results, differing in some respects, especially in the quantity of gluten and woody fibre, which by the same process are furnished by M. Abdia Geronzi, of Macerata, upon the soft wheats (Romanella) of the vicinity.

	M. le Marquis Sigismondo Bandini.	M. le Marquis Antici.	M. le Comte Luigi Salvadori.
Weight of a litre .....	824.00	833.00	817.00
Water ..... per cent.	13.00	13.60	13.40
Dextrine and soluble azotized substances .....	9.41	14.12	13.62
Starch .....	63.44	51.30	58.65
Gluten and fatty matter .....	23.22	23.15	23.04
Woody fibre .....	3.56	4.05	4.27
Ash .....	3.55	3.92	4.12

#### SPECIAL COLLECTIONS.

##### WHEAT, MAIZE, ETC.

##### NORTHERN ITALY.

#### 319 bis.—261. ALEXANDRIA (SUB-COMMITTEE OF).

Collection of the different qualities of corn in the province.

#### 320 bis.—268. BERGAMI, P., *Ferrara*.

Wheat.  
Maize.

#### 321 bis.—357\*. BOFONDI, C. PIETRO, *Forlì*. Cereals.

#### 322 bis.—288. DRAMMIS, S., *Scandale (Calabria Ulteriore II.)*.

Majolica wheat.  
Romanella wheat.  
Hybrid wheat.  
Odessa wheat.  
Saragolla wheat.  
Faggiano wheat.  
Peruvian wheat.

#### 323 bis.—295. GREFFI, ANTONIO, *Monterchi (Arezzo)*. Soft wheat, from Monterchi.

#### 324 bis.—2128\*. TORRI, LUIGI, *Bondano (Ferrara)*. Stiolo wheat.

#### 325 bis.—314. MODENA (DIRECTOR OF THE ROYAL BOTANIC GARDEN OF).

Monograph on the kinds of Maize.  
Varieties of maize collected and described by the late Prof. Brignoli.

#### 326 bis.—338. REVEDIN, Count GIOVANNI, *Ferrara*.

Wheat.  
Maize.

#### 327 bis.—2128. TORRI, LUIGI, *Ferrara*. Stiolo wheat.

##### SOUTHERN ITALY.

#### 328 bis.—352\*. ARRANGA, GIOVANNI ANGELO, *Serracapriola (Foggia)*.

Hard mountain wheat.  
Hard plain wheat.  
Soft wheat.

#### 329—354\*. BARONE, BROTHERS, *Foggia*.

Hard wheat (Saragolla).  
Soft white wheat.

**330.**—356\*. BOCCARDO, BRO-  
THERS, *Candela (Foggia)*.

Hard wheat (Saragolla).  
Hard wheat (Carlantino).  
Soft wheat (Carosella).

**331.**—371\*. DEL BUONO, EUGENIO,  
*St. Agata (Foggia)*.

Hard wheat (Saragolla).

**332.**—359. CAPPELLI, Cav.,  
*Foggia*.

Hard wheat (Saragolla).

**333.**—367\*. DANZA, DOMENICO,  
*St. Agata (Foggia)*.

Soft wheat (Carosella).  
Hard wheat (Carlantino).

**334.**—368\*. DANZA, GENNARO,  
*St. Agata (Foggia)*.

Carlantino wheat.

**335.**—369\*. DE FIDIO, GIUSEPPE,  
*Casaltrinità (Foggia)*.

Soft wheat.

**336.**—296. GUACCI, FERDINANDO,  
*Campobasso*.

Hard wheat (Saragolla).  
Hard wheat (Cignarelle).

**337.**—380\*. GIULIANI, LEONARDO,  
*S. Marco in Lamis (Foggia)*.

Soft wheat (Carosella).

**338.**—372\*. DE LEO, ANTONIO,  
*Casaltrinità (Foggia)*.

Soft wheat.

**339.**—385\*. LUCERA, MAYOR OF  
*(Foggia)*.

Hard wheat.  
Soft do.

**340.**—386\*. MELE, NICCOLÒ-  
GIUSEPPE, *S. Agata (Foggia)*.

Soft wheat (Carosella).

**341.**—387\*. MERCATILE, C.  
MICHELE, *Ascoli*.

Cereals.

**342.**—396\*. PELLEGRINO, DO-  
MENICO, *Casaltrinità (Foggia)*.

Soft wheat.

**343.**—2122. RUBINO, MICHELE,  
*Foggia*.

Soft Majolica wheat.

**344.**—2123\*. SANTORO, GA-  
BRIELE, *St. Agata (Foggia)*.

Hard wheat (Risciola).  
Hard wheat (Carlantino).  
Soft wheat (Carosella).

**345.**—2125\*. SARCINA, NICCOLO-  
RUGGIERO, *Casaltrinità (Foggia)*.

Soft wheat.

**346.**—2127\*. SINISCALCO, BRO-  
THERS, *Foggia*.

Hard wheat (Saragolla).  
Monograph of Chinese sorgho.  
Sorgho in grain.  
Molasses from Sorgho.  
Rum from Sorgho.

**347.**—2129\*. TREJAVILLE,  
ANTONIO, *Cerignola (Foggia)*.

Soft wheat.

**348.**—2130\*. TROJA, MAYOR OF  
*(Foggia)*.

Soft white wheat.

#### SICILY.

**349.**—260. ADRAGNA, Baron  
GIROLAMO, *Trapani*.

Canary grass or Scagliola.

**350.**—262. ALGOSINO, SALVA-  
TORE, *Leonforte (Catania)*.

Farro (hard wheat).

**351.**—358\*. CAMMERATA SCO-  
VAZZO, BARON ROCCO, *Palermo*.

Hard wheat, Giustalisa.

Hard wheat, Real-Forte.  
Hard wheat, Farro.

- 352.**—392.\* PATERNÒ CASTELLO, PRINCESS MARIANNA, Catania.

Tumolia wheat.  
Neapolitan wheat.  
Wheat (Farro) hard wheat.

#### SARDINIA.

- 353.**—264. ARESU, SATURNINO, *Selargius (Cagliari)*.

Ears of wheat.

- 354.**—300. LIGAS, ANTONIO, *Selargius (Cagliari)*.

Ears of wheat.

- 355.**—2131. MOSSIONE, C. MARCELLO, *Cagliari*.

Canary grass.

- 356.**—320. MURRU-MURRU, A., *Sanluri (Cagliari)*.

Buckwheat.

- 357.**—336. RAMO, STANISLAO, *Lacconi (Cagliari)*.

Hard wheat.

- 358.**—2124\*. SARAGATU, PIETRO, *Sanluri (Cagliari)*.

Murra wheat.  
White wheat.  
Starch prepared by hand.

#### RICE.

- 359.**—265. BELLESINI, BROTHERS, *Imola (Bologna)*,

13 specimens of rice, to illustrate its cultivation.

Chinese rice.  
Novara rice.  
American rice.

- 360.**—277. CASSOLA, CARLO, *Vercelli (Novara)*.

American rice from Anitre, near Vercelli.

- 361.**—363. CHIARINI, PAOLO, *Faenza (Ravenna)*.

Cleaned rice of different kinds.

- 362.**—308. MAROZZI, ERNESTO, *Pavia*.

White rice,  
Aquila rice.  
Novara rice.

- 363.**—313. MINUTOLI-TEGRINI, Count EUGENIO, *Lucca*.

Rice obtained without rotation of crops.  
Chinese and American rice, cleaned and uncleaned.

- 364.**—316. MONARI, CELESTINO, and CESARE, *Bologna*.

Several kinds of cleaned rice.

- 365.**—389\*. NERI, ANTONIO, *Bologna*.

Cleaned rice.

#### MIXED COLLECTIONS.

##### NORTHERN ITALY.

- 366.**—269. BOLOGNA (SOCIETY OF AGRICULTURE OF)

Collection of corn and other seeds, of the province of Bologna.

- 367.**—275. CASAZZA, Cav. ANDREA, *Ferrara*.

Roman wheat.  
Barley.  
Native maize (Formentone nostrale).  
Oats.  
Red chick peas.  
Lucerne.  
Fenugreek.  
Red clover.  
Common clover.  
Sainfoin.

- 368.**—290. FERRARA (ROYAL CHAMBER OF COMMERCE OF)

Roman wheat.

Stiolo wheat.  
 Summer wheat (marzuolo).  
 Wheat flour of grain.  
 Common maize.  
 Pignolino maize.  
 Yellow maize.  
 Maize flour.  
 Oats.  
 Rice.  
 White haricots.  
 Coloured haricots.  
 Chick peas.  
 Almonds of various descriptions.

**369.—297.\* GUIDA, G. GARGA-  
 RENO, Novara.**

Wheat.  
 Summer wheat (marzuolo)  
 Larghe wheat.  
 Risato wheat.  
 Winter wheat (Invernengo).  
 Andriolo wheat.  
 Winter wheat.  
 Andicolo wheat from Cordini.  
 Odessa wheat.  
 Winter wheat from Rieti.  
 Clustering wheat.  
 Fiandino wheat.  
 White winter wheat.  
 Black Sicilian wheat.  
 Neapolitan wheat.  
 Spelt wheat.  
 Wheat with lupins.  
 Wheat in the grain.  
 Sardinian wheat.  
 Savoy wheat.  
 American wheat.  
 Novara wheat.  
 Risato wheat.  
 Milan wheat.  
 Neapolitan wheat.  
 White wheat (rize).  
 German barley.  
 Portugal barley.  
 Hard barley.  
 Oats.  
 Mountain oats.  
 Rye (*Secale cereale*, L.).  
 Risato rye.  
 Romagna rye.  
 Novara rye.  
 Valsesia rye.

Italian millet.  
 German millet.  
 Roman millet.  
 Puglese millet.  
 Red peas.  
 Variable peas.  
 Peas in the stalk.  
 Haricot peas in the stalk.  
 Chick peas.  
 Black chick peas.  
 Chick peas in the stalk.  
 White chick peas.  
 Cickling vetches.  
 Variegated haricots.  
 Ash-coloured haricots.  
 Coffee-coloured haricots.  
 Screened haricots.  
 Vembone haricots.  
 Magnino haricots.  
 Lentil haricots.  
 Flesh-coloured haricots.  
 American haricots.  
 Long haricots.  
 Spotted haricots.  
 Chinese haricots.  
 Prese haricots.  
 Native haricots.  
 Wine-coloured haricots.  
 Pislaguino haricots.  
 Chestnut haricots.  
 Variegated haricots (marezzati).  
 Salsa haricots.  
 Red and black scimitar haricots.  
 Half size haricots.  
 Red haricots.  
 Portugal haricots.  
 Haricots badly made.  
 Ash-coloured haricots.  
 Yellow haricots.  
 Quarantinis haricots.  
 Marrone haricots.  
 White and black haricots.  
 Black haricots.  
 Haricots badly formed, with white eyes.  
 Meyasa haricots.  
 Two-faced haricots.  
 Eagle haricots.  
 White beans.  
 Red beans.  
 Black beans.  
 Borbottone beans.  
 Varied beans.

Beans in the stalk.  
 Favali.  
 Lupins.  
 Yellow lupins.  
 Large lupins.  
 Lupins in the stalk.

**370.—388. MILAN (CHAMBER OF COMMERCE OF), 1822.**

Wheat.  
 Wheat called half-semola.  
 Wheat called *semola fina*.  
 Wheat bran.  
 Maize, first quality.  
   Do. second quality.  
   Do. bran.  
 Rice in the husk for sowing.  
 Common rice of Fallavecchia.  
 Rice crushed of Fallavecchia.  
 Common rice crushed by M. Nasoni.  
 Native rice in the husk.  
 Rice said to be of superior quality,  
   crushed by M. Nasoni.  
 Rice in the husk of Novara.  
 Novara rice, crushed by M. Nasoni.  
 Novara rice, crushed by M. Nasoni  
   (superior quality).  
 Chinese rice in the husk.  
 Chinese rice, half-crushed by M.  
   Nasoni.  
 Chinese rice, entirely crushed by  
   M. Nasoni.  
 Native and Chinese rice, crushed by  
   M. Georges Salzmann.  
 Barley in the husk.  
 Barley crushed.  
 Rye.  
 Oats.  
 White millet.  
 Italian millet.  
 Red sorgho.  
 Rye grass seed.  
 Lucerne seed.  
 Clover seed.  
 Palma Christi seed.  
 Walnuts.  
 Colza.  
 Summer flax seed (Marzuolo).  
 Winter flax seed (Invernengo).  
 Hemp seed.  
 Peas  
 Red lentils.

White lentils.  
 White chick peas.  
 Beans, first quality.  
   Do. second quality.  
   Do. third quality.  
 Front egg kidney beans.  
 Eyed do.  
 Sparrow egg do.  
 Spanish do.  
 Aquila do.  
 Varese do.  
 Majolica do.  
 Long cannellini do.  
 Brona do.  
 Common borlotti kidney beans.  
 Dog do. do.  
 Masked do. do.  
 Black do. do. quarantine.  
 Quarantine do. do.  
 Lupin do. do.

**371.—315\*. MODENA (SUB-COMMITTEE OF).**

Cereals.  
 Vegetables.

**372.—394\*. PARMA (SUB-COMMITTEE OF).**

Wheat.  
 Various agricultural grains.  
 Fodder.

**373.—331. PAVANELLI, GIUSEPPE, Ferrara.**

Roman wheat.  
 Summer wheat.  
 Indian wheat.  
 Colza.

**374.—399\*. REGGIO (AGRICULTURAL SOCIETY OF).**

Common wheat.  
 Summer wheat (Marzuolo).  
 Great wheat.  
 Touselle corn.  
 Spelt wheat.  
 Maize.  
 White millet.  
 Italian millet.  
 Indian millet.  
 White oats.

Red oats.  
 Spelt wheat.  
 Barley in husk.  
 Picked barley.  
 Vetches.  
 Beans.  
 Native rice in husk.  
 Pavia rice.  
 Bertone rice.  
 Chinese rice.  
 Chick peas.  
 Field peas.  
 Chickling vetches.  
 Lentils.  
 Lupins.  
 White kidney beans.  
 French kidney beans.  
 Kidney beans.  
 Yellow kidney beans.  
 Aquila kidney beans.  
 Prud'homme haricots.  
 Sainfoin seed.  
 Lucern seed.  
 Rye grass seed.  
 Red clover seed.  
 Fennugreek seed.  
 May grass of a naturally irrigated meadow.  
 Fermented grass.  
 Fermented grass, 2nd cutting (Guaimé).  
 Fermented grass, 3rd cutting (Terzaruolo).  
 Lucerne.  
 Red trefoil.  
 Grass and fodder mixed.  
 Chestnuts.  
 Dry chestnuts.  
 Chestnuts used in proportions.  
 Hazel nuts.  
 Hazel nuts, with large kernels.

**375.—2120. REGGIO, EMILIA**  
(AGRICULTURAL SOCIETY OF).

Rice in the husk, cleaned, native.  
     do.           do.           Pavese.  
     do.           do.           Bertone.  
     do.           do.           Chinese.

Farro cleaned.  
 White millet cleaned.  
 Chick peas.

Wheat covers almost half the lands in the plains, and alternates in periods of two years each with the other crops.

The summer wheat (*grano marzuolo*) is little cultivated, the grain being exported to Tuscany, for the manufacture of straw for bonnet-making.

The large wheat is cultivated in the fertile or inundated lands.

The spelt (*T. spelta*) is cultivated for forage.

Maize covers a fifth to a fourth of the whole country, and especially serves for food amongst the rural population, in the form of *Polenta*.

The German and Italian millet are used chiefly for fodder.

The sorgho seeds are used for cattle, pigs, and poultry. Brooms are made of the stalks.

Oats and barley, little cultivated generally, are used for cattle with grain or green fodder.

The barley (*scandella*) is cultivated in elevated places.

Rice occupies a superficies of 2,500 hectares; the Chinese variety is preferred; and water for irrigation is obtained by means of machinery.

Amongst the vegetables, beans, vetches, and lupins are alternated with corn; the grain of the former are used to feed animals, while their flour is employed in the composition of the bread used by the peasants.

Chick peas and lentils are of limited importance.

Haricots are intermingled with maize; the *prud'homme* variety (*Fagiolini*) is gathered after the mowing of the green fodder.

**376.—337. RAVENNA (SUB-COMMITTEE OF).**

Wheat.

Rice.

Beans.

Oats.

**377.—348. TURIN (ROYAL ACADEMY OF AGRICULTURE).**

SECTION I.—CEREALS.

1. WHEAT.—Common wheat (*Triticum vulgare*, Vill.).

VARIETIES AND DESCRIPTIONS.

1st Species.

White bearded winter wheat (*T. hybernum aristatum*).

White wheat.  
 Red wheat.  
 Reddish wheat.  
 Beardless wheat.  
 Hairy wheat.  
 Whitish wheat.

Summer wheat (*T. vulgare aestivum*).

White bearded wheat.  
 White beardless wheat.

*2nd Species.*  
 (*T. turgidum*.)

Andriolo wheat.  
 Hairy six-rowed wheat.  
 Red six-rowed wheat.  
 Black six-rowed wheat.  
 Clustering six-rowed wheat.  
 Andriolo with four rows.  
 White wheat.  
 Red wheat.  
 Violet wheat.

*3rd Species.*  
 (*T. hordeiforme*.)

Hard wheat.  
 White wheat.  
 Red wheat.  
 Hairy violet wheat.  
 Red fescue-like spelt wheat.  
 Scandella spelt wheat.

*4th Species.*  
 (*T. intortum*.)

Ceres hair.

*5th Species.*  
 (*T. monococcum*.)

Small spelt wheat.

2. MAIZE. — Common maize (*Zea Mays*, Linn.)

VARIETIES AND DESCRIPTIONS.

Hairy seeded (*Z. Mays cryptosperma*).  
 Red maize.

Naked seeded maize (*Z. denudata*).

Common red maize.  
 Bariolo maize.  
 Chili maize.  
 Violet maize.  
 White bearded maize.  
 Rough maize.  
 Yellow bearded maize.  
 Red bearded maize.  
 Montezuma, or Mexican winter maize.  
 Red maize.  
 Horse-tooth maize.  
 Old-woman-tooth maize.  
 Giant maize.  
 Red maize.  
 Roman cinquantin maize.  
 Compressed maize.  
 Quarantin maize.  
 Pigmy maize.  
 Crystalline black maize.  
 Harlequin maize.

3.—MILLET (*Panicum italicum*, Linn)

Giant millet.  
 Dwarf German millet.

SECTION II.—VEGETABLES.

4.—HARICOT (*Phaseolus*).

*1st Species.*

(*Ph. multiflorus*) Scarlet runner.

Climbing red haricot  
 Do. white haricot.  
 Do. two-coloured haricot.  
 Do. shiny haricot.

*2nd Species.*

(*Ph. romanus*.)

Poulard haricot, great.  
 Poulard haricot, small.  
 Poulard haricot, medium-sized.  
 Poulard haricot, smallest.

*3rd Species.*

(*Ph. macrocarpus*.)

Baccellone haricot.  
 Ditto. yellow speckled.

## 4th Species.

(Ph. vulgaris.)

Quagliarini haricot, (seeds of one colour.)

- Do. large golden.
- Do. small.
- Do. sulphureous.
- Do. dirty white.
- Do. banded.
- Do. striped.
- Do. compressed.

## 5th Species.

(Ph. sphaericus.)

Round haricot, (seeds of one colour, never white).

- Do. threadless.
- Do. fleshy.
- Do. lupinello.
- Do. red.
- Do. black.

Seeds white, with a spot on the lower part.

Do. of one colour.

Haricot, round, white, red.

- Do. black.
- Do. red speckled.
- Do. banded.
- Do. imperial.

## 6th Species.

(Ph. hæmatocarpus.)

Haricot, blood-colour.

- Do. banded.
- Do. speckled.
- Do. unequal

## 7th Species.

(Ph. saponaceous.)

Imperial haricot.

- Do. red spotted.
- Do. black.
- Do. white.

## 8th Species.

(Ph. oblongus.)

Sargentone haricot, oblong.

(Seeds of one colour):—

Haricot fleshy.

- Do. purple.
- Do. black.
- Do. golden.
- Do. reddish.

(Seeds half speckled):—

- Do. oblong.
- Do. violet banded.
- Do. purple.
- Do. speckled.
- Do. blue spotted.
- Do. blue shaded.
- Do. red striped.
- Do. black striped.

## 9th Species.

(Ph. tumidus.)

Pearled haricot.

- Do. greater.
- Do. smaller.
- Do. threadless.
- Do. golden.
- Do. amethystine
- Do. spotted.

## 10th Species.

(Ph. gonospermus.)

Bushel haricot.

- Do. spotted.
- Do. white.

## 11th Species.

(Ph. rufus.)

Granatino haricot.

## 12th Species.

(Ph. cuneatus.)

Sabre haricot.

- Do. purple.
- Do. half spotted.
- Do. violet speckled.
- Do. red and black.

## 13th Species.

(Ph. inamæmus.)

Mandarin haricot.

- Do. white, with golden eye.
- Do. red.
- Do. half spotted.

## 14th Species.

(Ph. Mungo.)

Kidney beans for sauce.

## 15th Species.

(Dolichos dubia.)

Wild kidney beans.

Do. with black eye.

Do. common, with golden eye.

Do. do. do. green eye.

Do. reddish.

Do. speckled.

Do. red and black.

## 16th Species.

(D. sesquipedalis.)

Do. American.

5.—CHICK PEAS (*Cicer Arietinum*).

Peas, large.

Do. rough.

Do. black.

6.—BEANS (*Faba vulgaris*, Moench).

Beans, common white.

Do. red.

Do. green.

Do. large.

Do. little green.

Do. violet.

7.—PEAS (*Pisum sativum*, Linn).

Peas, common, soft codded.

Do. yellow spotted.

Do. large white.

Do. purplish red.

Do. hard codded, speckled.

Do. rough.

Do. dwarf.

Do. Dutch.

8.—LUPIN (*Lupinus albus*, Linn).Yellow golden lupin (*Lupinus luteus*).9.—VETCHES (*Vicia narbonensis* L.).10.—FENUGREEK (*Trigonella fœnum græcum*, L.).

## CENTRAL ITALY.

## 378.—351. AREZZO (SUB-COMMITTEE OF)

Flax seed.

Collection of Agricultural Products of the province of Arezzo.

## 379.—270. BURESTI, FRANCESCO, Arezzo.

Soft corn (Tosello).

Rye.

Maize.

Lentils.

Chickling vetches (Cicerchie).

Chick peas, white, called Spanish.

Beans.

## 380.—281. CHERICI, NICCOLO, Borgo San Sepolcro (Arezzo).

Soft fine white wheat (grano gentile).

Soft red wheat.

Soft serrachio wheat.

Soft biancone wheat.

Soft summer wheat (marzuolo).

Hard wheat.

Maize flour.

Semola.

Bread.

Polenta (boiled flour).

Chestnuts.

Chestnut flour.

Chestnut polenta.

## 381.—286. DE GIUDICI, FILIPPO, Arezzo.

Corn called calbigia from Arezzo, Capolana, Cortona, and Valdichiana.

Red wheat from Arezzo and from Cortona.

Mixed wheat from Valdichiana.

Maize.

Oats.

Millet.

Beans.

Blue haricots from Casentino.

Chick peas.

Lupins.

**382.**—296 bis.\* GUERRI, LUIGI,  
Firenze.

Cereals and products (See Table,  
page 88).

**383.**—302.\* LUCCA (SUB-COM-  
MITTEE OF)

Collection of cereals and other pro-  
ductions of the province.

CEREALS.

Soft wheat.  
Do. fine, gentile, for bread, Campio.  
Do. fine, gentile, for bread, Mar-  
zuolo.  
Wheat, soft, fine, gentile, for bread  
(Tosello)  
Do. hard, for pastry.  
Spelt.  
Hard white wheat for pastry.  
Hard Sicilian wheat for pastry.  
Picked barley, various.  
Barley in husk, do.  
Picked spelt, do.  
Spelt in husk, do.  
Oats.  
Rye.  
Beans, vetches, seeds, and rye  
mixed.  
May maize.  
Sessantino maize.  
Red maize, or spadone.  
Red sorgho.  
Sorgho for brooms.  
White millet.  
Italian millet.  
Chinese rice.  
American rice.  
Italian rice.

VEGETABLES.

Green field beans.  
Common field beans.  
Marmina red beans.  
Spanish, common white chick peas.  
Red chick peas.  
Lentils.  
Peas.  
Lupins.

Vetches.  
Turkish red kidney beans.  
Turkish white do.  
Chapon do.  
Marble do.  
Torn do.  
Eyed do.  
Kupinari do.  
Faggiolini do.  
Yellow do., with three arches.  
Greek do.  
Small Greek do.  
Climbing Greek do.  
Anchenne do.  
Black do., with three arches.  
Do. do., one arch.  
White do.  
Climbing, white, do.  
Giant, white, do.  
Giant, grey or flowered, do.

ROOTS.

Potatoes.  
Roots of *Helianthus tuberosus*.

VARIOUS FRUITS.

Sweet fennel.  
Strong or bitter fennel.  
Raisins.  
Olives (*Olea europæa*), frantojane.  
Do. do. martelline.  
Do. do. baccole.  
Do. do. cucche.  
Do. do. grafted cor-  
reggiole.  
Do. do. wild do.  
Do. do. common.  
Do. do. do. grafted.  
Do. do. colombines.

Figs, ottati, dry.  
Figs, various, dry.  
Sweet almonds.  
Bitter almonds.  
Fresh and dry carpinesi chestnuts.  
Fresh and dry pastinesi chestnuts.  
Fontallesi chestnuts.  
Horse chestnuts.  
Wild chestnuts.  
Soft walnuts in the shell (*premicì*).  
Partly soft walnuts (*demi-premicì*).

Common nuts,  
Small nuts.  
Hazel nuts.  
Lecceine acorns (of holm oak).  
Cerrine acorns (of oak).  
Soverine acorns (of cork tree).  
Common acorns.  
Average acorns.  
Fine almonds.  
Arbutus berries.

#### FLOUR AND ALCOHOL.

Wheat flour.  
Rice flour.  
Red sorgho flour.  
Spadone maize flour.  
Summer maize flour.  
York elm chestnut flour.  
Pastinesi chestnut flour.  
Arbutus alcohol of 30° and 32°.

This collection is accompanied by an account, by Professor Cesare Bicchi, and by a pamphlet by Marquis Antonio Mazzarosa, entitled *Pratiche della campagna Lucchese*.

#### SOUTHERN PROVINCES.

#### 384.—353\*. ASCOLI (SUB-COMMITTEE).

Collection of cereals and vegetables.

#### 385.—355\*. BARACCO, BROTHERS, Catanzaro (*Calabria Ultra II.*).

Agricultural products.

#### 386.—272\*. CAMPOBASSO (SUB-COMMITTEE OF).

Soft Carosella wheat.  
Hard Saragolla wheat.  
Maize.  
Roccomandolfi lentils.  
Hemp seed.  
Various descriptions of seed.

#### 387.—361\*. CASERTA (BOTANIC GARDEN OF), *Terra di Lavoro*.

Oats of the 1st and 2nd quality.  
Hungarian black oat.  
Carosella wheat.  
Hard wheat.

#### Compound wheat (*Triticum compositum*).

Kars wheat.  
Odessa wheat.  
Peruvian wheat.  
Giant wheat.  
Rich wheat.  
Beardless wheat.  
Tangarong wheat.  
Soft wheat.  
Beans.  
Spanish kidney beans.  
Mungo do.  
Pistacchino do.  
Peas do.  
Dutch do.  
China rice do.  
Queen's red do.  
Barley.  
Ground nuts.  
Burbrig peas.  
Cavaliere peas.  
Chinese peas.  
Spiccoso peas.  
Dwarf peas.  
Dutch dwarf peas.

#### 388.—362\*. CASSANO, FRANCESCO, (*Giosa Bari*).

Hard wheat of 1861.  
Barley.  
Maize.  
Oats.  
Mustard.  
Fennel.

#### 389.—283. CHIETI (SUB-COMMITTEE OF).

Tosello white Hungarian wheat.  
Red risciola wheat.  
White risciola wheat.  
Soft wheat.  
Large white pollard wheat.  
Summer wheat (*marzuolo*).  
Maize.  
Petaniella wheat.  
Panella wheat.  
Clustering wheat.  
Saragolla wheat.  
Large spelt wheat (*Farrone*).  
Picked spelt wheat (*Farro brillante*).

Small spelt wheat (*Spelta*).  
 Rye wheat (*Secale cereale*).  
 Barley (*Hordeum* sp. and var.).  
 Picked barley (*Orzo brillato*).  
 Common oats (*Avena sativa*).  
 Summer maize (*Zea Mays*).  
 Azeppa maize do.  
 Tentinello maize do.  
 Large Apulian bean (Pugliese).  
 Large common bean.  
 Small bean (Favetta).  
 White kidney beans (Javicolli).  
 Small do.  
 Queen's do.  
 Red do.  
 Horse do.  
 Black do.  
 Yellow do.  
 Eyed do.  
 Chickling vetch.  
 Great white chick peas.  
 Small chick peas.  
 Red chick peas.  
 Great and small lentils.  
 Lupins.  
 White peas.  
 Green peas.  
 Trout egg peas.  
 Tarchioli.  
 Great vetch.  
 Linseed.  
 Hemp seed.

**390.—377.\* FOGGIA** (SUB-COMMITTEE OF)

Oats from near Foggia.  
 Barley.  
 Kidney beans.

**391.—292. GABRIELE, D. ANTONIO,** *San Bartolomeo in Galdo (Benevento).*

Cereals.  
 Vegetables.

**392.—293. GIORDANO, Prof. EUGENIO,** *Salerno.*

Collection of agricultural products of the province of Salerno.—  
 Collection of picked grain.

**WHEAT.**

Summer wheat (Marzuolo or granello).  
 Mesnil Saint Firmin wheat.  
 Hard saragolla wheat.  
 Saumur wheat.  
 Cape beardless wheat of autumn.  
 Cultivated wheat (Marzuolo).  
 Taganrok wheat.  
 Pietel wheat.  
 Saint Helena, or giant wheat.  
 Rich wheat.  
 Xeres wheat.  
 Prolific Xeres wheat.  
 Risciola wheat.  
 Red mixed wheat.  
 White mixed wheat.  
 Carosella wheat.

**WHEAT IN THE EAR.**

Summer wheat (Marzuolo).  
 Mesnil Saint Firmin wheat.  
 Cape wheat, without beard.  
 Odessa wheat.  
 Caucasian wheat.  
 Saumur wheat.  
 Petaniello black wheat.  
 Pietel wheat.  
 St. Helena wheat, or giant wheat.  
 Prolific wheat.  
 Xeres wheat.  
 Xeres prolific wheat.

**BARLEY.**

Common barley (*Hordeum vulgare* L.).  
 Cavaliere barley, *H. distichum*, L.)

**BARLEY IN THE EAR.**

Cavaliere barley.  
 Trifolcate barley.

**OATS.**

Common oats (*Avena sativa*).  
 Cheneille oats.  
 Black oats from Bric.  
 Weeded oats.  
 Polish oats.

## OATS IN THE EAR.

Common oats.  
 Cheneille oats.  
 Black oats from Bric.  
 Weeded oats.  
 Polish oats.

## SORGHOS IN THE EAR.

*Sorghum scoparium rubrum.*  
*Sorghum vulgare pubescens.*  
*Sorghum compactum.*  
*Sorghum saccharatum.*  
*Sorghum rubens.*  
*Sorghum rubens varietas.*  
*Sorghum glycichylum.*  
*Sorghum Dourra.*

## MAIZE.

White Mexican maize.  
 Yellow Mexican maize.  
 Common maize.  
 Spotted maize.  
 Sugared maize.  
 King Philip maize.  
 Autumn maize.  
 Cinquantino maize.  
 Maize, ditto ordinaire, 1st quality.  
 Maize, ditto white.  
 Cinquantino, yellow, Puglino maize.  
 Maize cerretano.  
 Cinquantino, 2nd quality maize.

## MAIZE IN THE EAR.

Sugared maize.  
 White Mexican maize.  
 Yellow Mexican maize.  
 Spotted maize.  
 Maize, cinquantino, common, 1st quality.  
   Do. white.  
   Do. yellow, Puglino.  
   Do. of Julien.  
   Do. cerretano.  
   Do. cinquantino, 2nd quality.

## KIDNEY BEANS.

Kidney beans, rich.  
   Do. white, common.  
   Do. early tabacchigni.  
   Do. red cannellini.  
   Do. black do.

## Kidney beans, white cannellini.

Do. yellow do.  
 Do. March.  
 Do. rice.  
 Do. eyed.  
 Do. small cock.  
 Do. gigantic.  
 Do. Chinese.  
 Do. flat half-moon.

## BEANS.

Large beans.  
 Average beans, or half beans.  
 Small beans.  
 Nocera, or early beans.

## LENTILS.

Large lentils.  
 Small lentils.  
 White chick peas.

## LINSEED AND HEMP SEED.

Common linseed.  
 Yellow linseed.  
 Riga linseed.  
 Royal linseed.  
 Femmelette linseed.  
 Dutch linseed.  
 Common hemp seed from the valley of Diano.

## FLAX IN STALK.

Femmelette flax.  
 Yellow seeded flax, of which the fruit is ripe.  
 Yellow seeded flax, gathered before the maturity of the fruit.  
 Dutch flax.  
 Riga flax.  
 Royal flax.  
 Common flax.

## FODDER AND GRAIN.

Spanish sainfoin (Sulla di Calabria).  
 Lupins.

## CULTIVATED ROOTS AND TUBERS.

Roots of *Helianthus tuberosus*.  
 Carrots.  
 Red and white sweet potatoes.

UNCULTIVATED ROOTS AND TUBERS  
EMPLOYED IN MANUFACTURES.

*Asphodelus ramosus*.  
*Arum Italicum*.  
*Pancratium maritimum*.

OLEAGINOUS SEEDS.

Ground nuts.

There are several varieties of the sweet potato—the red, the white, the long yellow, the rose of Malaga, the white of the Isle of France, the violet of New Orleans—which are more easily preserved than others.

Being originally from tropical countries, introduced and cultivated during three centuries in Spain and Portugal, it was imported into France in the time of Louis XV., abandoned and resumed in the time of the Empire, and, at a still later period, re-established by the Society of Horticulture at Paris. But M. Giordano claims the merit of being the first to cultivate it with success.

Being a sweetish starchy substance, the roots constitute food for man and cattle, for which it also furnishes, by its leaves, a fodder, which, when dried, is estimated at three times the value of hay. In its cultivation it holds a place among the weeded plants, and does not require such choice of soil or of manure.

Its propagation is obtained by cuttings, and M. Giordano, for this purpose, makes the buds of the tubers germinate under a heap of manure, and afterwards the shoots, which are very numerous, are cut. They are then fit to be planted.

M. Giordano has also succeeded in preserving the tubers in sand, under which they are regularly buried. The time of planting is from the month of May to July; the crop is from September to November.

393.—383. LECCE (SUB-COMMITTEE OF), *Terra d'Otranto*.

Hard and soft wheat.  
Barley.  
Maize.  
Millet.  
Lupins.  
Kidney beans.  
Peas.  
Linseed.  
Fennel.  
Walnuts.  
Almonds.  
Raisins.

394.—385\*. LUCERA (MAYOR OF).  
Soft wheat.  
Hard wheat.

395.—303. MACERATA (SUB-COMMITTEE OF).

Soft Romanella wheat.  
Soft Calbigia wheat.  
Hard wheat (*Triticum durum*).  
Common maize.  
Dwarf maize.

396.—318. MONTORI, GIUSEPPE,  
*Colonnella (Abruzzo Ulteriore I.)*.

Agricultural products.

397.—(Wanting.)

398.—391\*. PACCA, Marquis GIUSEPPE, *Benevento*.

Mixed wheat.  
Romanella wheat.  
Risciola wheat.  
Carosella wheat.  
Saragolla wheat.  
Oats.  
Barley.  
Maize (spelt).  
White and eyed kidney beans, chick peas, lentils, peas, and beans.

399.—333. PISTILLI, FEDERICO,  
*Campobasso*.

Soft Carosella wheat.  
Hard Tomminia marzuola wheat.  
Chick peas.

400.—323. PADRI BENEDET-  
TINI DI MONTE CASSINO  
(*Catania*).

Farro (hard wheat) spelt.  
Farro petit panizzo.  
Majorca wheat.  
Tumolia wheat.  
Barley.  
Beans.

**401.—397. PESARO (ACADEMY OF AGRICULTURE).**

Collection of cereals.  
Collection of vegetables.  
Castor oil.  
Walnuts.

**SICILY.****402.—376. FIAMMINGO, SALVADORE, Giarre (Catania).**

Maize.  
Rice.  
Kidney beans.  
White French peas.  
Yellow peas.  
Mastalesi peas.  
Chick peas.  
Lupins.  
Almonds.

**403.—381. GIUDICE, GIOVANNI, Favara (Girgenti).**

Hard corn, trentina variety.  
Linseed.  
Soft shelled almond.

**404.—304. MAJORANA, BARONE (OF NICORRA), Catania.**

Hard Tumolia wheat.  
Do. Neapolitan wheat.  
Do. black wheat.  
Do. Fagiano wheat.  
Do. Manfredonian wheat.  
Do. Majorca wheat.  
Do. Scardile wheat.  
Do. Odessa wheat.  
Do. Romanella wheat.  
Do. Hybrid wheat.  
Do. Saragolla wheat.  
Farro (hard wheat).  
Peruvian barley.  
Rye.  
Rice of first and second quality.  
Rice straw.  
Rice husks.  
Sorgho.  
White beans of first and second quality.  
Turkish beans.  
Cleaned beans.

White kidney beans.  
Small green do.  
Prince chick peas.  
Common peas.  
Peas from Militello.  
Do. from Bronte.  
Chikling vetches.  
Lentils from Bronte on Etna.  
Lentils from Militello.  
Militello maize.  
Red maize in the ear.  
Deep red maize in the ear.  
White maize in the ear.  
Canary grass of 1860.  
Do. 1861.  
Oats from the fief Ivaldo.  
Do. Arcimusa.  
Oak acorns from Etna.  
Holm-oak acorns from Bronte on Etna.  
Pine stone seeds.  
Sesamum.  
Mustard.

**405.—306. MANCUSO, MARCO, Catania.**

Royal strong wheat.  
Hard wheat (Farro).  
Canary grass.  
Oats.  
Beans.  
Massalesi kidney beans.  
Chikling vetches.  
Spanish sainfoin (Sulla di Calabria).  
Linseed.  
Mustard seed.

**SARDINIA.****406.—266. BELTRAMI, (Count PIETRO) Cagliari.**

Wheat in the ear.  
Rice of the 1st cultivation.  
Beans (*Faba vulgaris*, Moench).

**407.—271. CAGLIARI (SUB-COMMITTEE OF).**

Wheat of the 1st, 2nd, and 3rd qualities.  
Semola of the 1st, 2nd, and 3rd qualities.

- Flour of the 1st, 2nd, and 3rd qualities.  
 Volatile flour.  
 Bran.  
 Small bran (*Cruschetta*).  
 Starch of the 1st, 2nd, and 3rd qualities, worked in two different ways.  
 Barley of the 1st and 2nd qualities.  
 Sugar sorgho (stalks).  
 Canary grass (*Scagliola*).  
 Beans of the 1st, 2nd, 3rd, and 4th qualities.  
 Chick peas.  
 Kidney beans.  
 Chickling vetches.  
 Almonds of the 1st, 2nd, and 3rd qualities.  
 Walnuts.  
 Wild nuts.  
 Chestnuts.  
 Pistachio nuts.  
 Dried figs.  
 Dried raisins.  
 Fennel.  
 White mustard seed.
- 408.**—273. CAODE SAN MARCO, Count *EFISO*, *Cagliari*.  
 Hard wheat, ear, and grain.  
 Grey hard wheat, ear, and grain.  
 Barley.  
 White chick peas, called Spanish.  
 Beans.  
 Kidney beans.  
 Lentils.  
 Chickling vetches,
- 409.**—307. MARINI-DEMURO, T., *Cagliari*.  
 Wheat.  
 Barley.
- Beans.  
 Chick peas.  
 Chickling vetches.
- 410.**—305. MAMELI, FEDERICO, *Selargius (Cagliari)*.  
 Wheat in the ear.  
 Beans.
- 411.**—311. MELIS, GIOVAN BATISTA, *Quartu (Cagliari)*.  
 Wheat.  
 Beans.  
 Barley.
- 412.**—374. DE MURTAS, ELIA, *Lanusei (Cagliari)*.  
 Wheat of various qualities.  
 Chick peas.  
 Kidney beans.
- 413.**—344. SERRA, LUIGI, *Iglesias (Cagliari)*.  
 Wheat from Sulcis and Iglesias.  
 Maize from Flumini and Villaperuccio.  
 Barley from Flumini and Villaperuccio.  
 Dried raisins from Iglesias.
- 414.**—345. SPANO, LUIGI, *Oristano (Cagliari)*.  
 Sicilian wheat.  
 Barley.  
 Maize.  
 Chick peas.  
 Beans.  
 Cones of *Pinus Pineae*.
- 415.**—(Wanting.)

## § 2. VEGETABLES.

The importance of vegetables is considerable, although of a secondary character as compared with cereals, both in their general production and their ordinary use. The produce is estimated to be as high as 3,400,000 hectolitres, which is almost exclusively used for home consumption, with a trade from province to province, in order to apportion the supplies to the wants of localities which do not grow sufficient, or which exchange their produce for that of other places.

There are amongst vegetables in Italy many nutritious varieties, such, for example, as the climbing kidney beans (scarlet runner) (*Phaseolus multiflorus*), the common white kidney bean (ordinary white, haricot de Soissons, *Phaseolus romanus*, Savi), the kidney bean without the skin, or *fagioli baccelloni* (*Ph. macrocarpus*); common coloured kidney beans (*Phaseolus*

*vulgaris*, Savi); round kidney beans (*Phaseolus sphericus*); red or blood-coloured kidney beans (*Phaseolus haematocarpus*), long kidney beans (*Phaseolus oblongus*), eyed kidney beans (*fagio dall'occhio*, *Dolichus Lubia*), chick peas (*Cecì*, *Cicer Arietinum*), peas (*piselli*, *Pisum sativum*), lentils (*lenti*, *Ervum lens*) of Asiatic origin; grey peas, pigeon peas, and sheep peas (*Robiglie*, *Pisum arvense*), which are indigenous in Italy.

Other leguminous plants, such as beans (*fave*, *Faba vulgaris*, L.), vetches (*veccia*, *Vicia sativa*), chickling vetches, peas, square peas (*Cicherchie*, *Lathyrus sativus*), are used as food for both men and cattle.

The lupin (*lupini*), especially the white lupin (*Lupinus albus*), but more rarely the yellow lupin (*lupino giallo*, L.; *luteus*, L.), or the variegated lupin (*L. varius*), perform an important part in agriculture, in addition to their use as food, for which they are only occasionally used; although, deprived of their bitterness by cooking and by maceration in water, and then preserved, they are a cheap delicacy. Both the seed and the plant of lupins are used as manure; the former, after having had its vegetating powers destroyed by being slightly roasted or immersed in boiling water; whilst the latter are buried in a green state (*sovesci*). When ripe this plant yields a textile fibre, which it has been sought to turn to advantage.

With the exception of kidney beans, which are somewhat largely cultivated in market gardens and in the open fields (where they are planted between the rows of maize), beans, peas, &c., are not cultivated to any great extent in Italy.

The seed of kidney beans, chick peas, chickling vetches, and more rarely beans, are eaten cooked; but chick peas and beans are sometimes eaten in a raw state, before they become ripe, either shelled or in the pods.

Chick peas are sometimes roasted, and used as a substitute for coffee. The stems of the plant are used in the houses in which silkworms are reared. Besides their use as forage, beans, vetches, pigeon peas, ground and mixed with barley, rye, or corn flour, are used to make a sour and somewhat coarse bread, with which the peasantry are fed, especially in the mountainous parts, where there is no chestnut meal, and in other poor districts.

A vegetable diet requires a concurrence of favourable circumstances in order to be supported for a length of time. Chickling vetches cause a particular disease, a sort of *raphanie*, noticed periodically by medical men where this vegetable holds too large a place amongst the articles of food.

The ordinary production of vegetables is the following:—

	Hectolitre per Hectare.	Weight per Hectolitre.	Weight compared to that of Wheat.
Beans .....	30	88 kilogs.	1
Kidney beans .....	30 to 50	77 "	1
Peas .....	10	82 "	1
Lentils .....	10 to 20	85 "	1
Chick Peas .....	6	85 "	1
Vetches .....	6	80 "	1

According to this Table, the quantity of vegetables produced in Italy may be estimated at three million hectolitres, which, compared with the 72 million hectolitres of cereals, will be about as 1 to 24. But there are enormous differences, according to different localities; and whilst the production of vegetables bears this proportion to the production of wheat in the ancient provinces of the kingdom, it amounts to one quarter in Calabria Ulteriore II. We here present the different proportions of these products, as they are found in the Bolognese, at least where we have the data at hand:—

Beans .....	52,829 hectolitres
Kidney beans .....	8,650 "
Small peas .....	2,183 "
Chick peas .....	2,064 "
Lupins .....	789 "
Lentils .....	124 "
Chickling vetches .....	119 "

The Royal Italian Commission is enabled, through the exertions of Sig. Stefanelli, a distinguished Florentine chemist, to publish the following analysis, which, although by no means complete, can be compared in the same manner as those of the cereals. The process adopted, having been previously established, is identical with that of Sig. Guerri for the cereals mentioned above. The value of this extensive series of experiments has shown us the great utility there would be in enlarging it, by obtaining the analyses of other parts of the plants, and also by embracing the produce of other localities. Without such a work it might be possible to know approximately the productions of different districts, but we cannot but feel that our present knowledge is insufficient for the special wants of our time.

# ANALYSIS OF VARIOUS VEGETABLES. BY M. PIETRO STEFANELLI, OF FLORENCE.

## VEGETABLES IN THE NATURAL STATE, WITHOUT PRELIMINARY ARTIFICIAL DESICCATION.

LOCALITY WHENCE DERIVED.					PRODUCER.	Weight of a Litre of vegetables.	Specific Weight.	Water.	Inor. organic matter.	Organic non-anisole matter.	VEGETABLES DRIED AT +140°	
DESCRIPTION OF VEGETABLE.		Organic anisole matter.		Organic non-anisole matter.								
1	Common white kidney beans	Bolgheri	M. W. Gherardesa	723.0	1.210 + 16° C	14.60	3.71	24.18	55.01	3.76	28.31	67.93
2	" "	Monteverchi	M. G. Rosi	841.6	1.31	13.96	3.04	23.94	59.02	3.53	37.47	68.60
3	" "	Laterna	M. A. Rosi	815.7	1.23	12.94	3.56	23.78	59.98	4.04	37.24	68.68
4	" "	Plantavigne	"	814.0	1.250 + 19° C	13.56	3.43	21.88	61.13	3.97	25.32	70.71
5	Large kidney beans	Castel S. Niccolò	M. S. Lanini	770.8	1.210 + 16° C	12.61	3.28	21.42	62.59	3.46	24.31	71.63
6	" "	San Giovanni	M. S. C. Rosi	715.7	1.11	12.96	4.30	21.82	55.53	6.14	28.75	69.07
7	Small kidney beans	Casalina	Padri Benedettini	849.7	1.250 + 16° C	13.50	3.48	21.39	61.83	4.01	24.67	71.32
8	" ochraceous	"	"	824.7	1.26	13.41	3.35	19.07	64.14	3.91	23.02	74.07
9	" variegated	Laterna	M. A. Rosi	779.8	1.210 + 14° C	13.76	3.07	18.87	65.50	3.52	31.41	75.07
10	" "	Plantavigne	"	796.5	1.250 + 17° C	13.62	3.20	20.03	63.08	3.70	23.25	73.95
11	" "	Casalina	Padri Benedettini	784.2	1.180 + 14° C	14.01	3.27	22.39	59.73	3.81	26.74	69.45
12	Eyed kidney beans (Dolichos melanophthalmus)	Laterna	M. B. Rosi	747.5	1.120 + 16° C	13.24	3.00	21.81	61.96	3.46	28.14	71.40
13	Do.	Plantavigne	"	757.6	1.140 + 19° C	13.14	2.89	24.70	59.23	3.33	28.45	68.22
14	Chick peas	"	"	820.7	1.32 + 19° C	13.22	2.52	18.76	65.40	2.90	31.74	75.34
15	" "	Laterna	"	818.0	1.320 + 16° C	12.04	2.60	18.82	66.54	2.95	31.39	75.65
16	" "	Cagliari (Sardinia)	M. C. Cao	800.7	1.240 + 18° C	14.00	2.56	19.85	63.59	2.98	23.08	73.94
17	" "	Bolgheri	M. W. Gherardesa	828.6	1.310 + 14° C	13.66	2.15	20.93	65.14	2.46	22.96	74.58
18	" "	Casalina	Padri Benedettini	840.6	1.310 + 14° C	13.66	2.42	17.23	66.80	2.85	19.91	77.24
19	Lentils (Ervum lens)	Plantavigne	M. B. A. Rosi	816.0	1.290 + 19° C	13.50	2.47	17.23	66.80	2.85	19.91	77.24
20	" "	Laterna	"	810.0	1.290 + 16° C	13.05	2.42	22.12	62.41	2.78	25.43	71.79
21	" "	Cagliari	M. A. Rosi	788.3	1.300 + 10° C	13.32	2.07	24.77	59.64	2.38	28.57	69.05
22	" "	Bolgheri	M. C. W. della Gherardesa.	822.2	1.150 + 16° C	13.78	2.50	24.96	59.06	2.55	28.95	68.50
23	Small peas (Pisum sativum)	Scandell, near Florence	Padri Benedettini	841.9	1.270 + 16° C	14.31	2.08	21.03	62.58	2.43	24.54	73.03
24	" "	Plantavigne	M. Rosi, B. Antonio	781.7	1.200 + 19° C	14.04	2.96	23.87	59.33	3.44	27.54	69.07
25	Genes (Lathyrus Cera)	Cagliari (Sardinia)	M. C. Cao	797.2	1.190 + 10° C	13.80	2.09	26.14	57.97	2.42	30.33	67.25
26	" "	Plantavigne	"	813.6	1.210 + 19° C	13.32	2.37	26.78	57.51	2.74	30.90	66.36
27	" "	Laterna	M. Rosi, B. Antonio	771.6	1.210 + 16° C	13.66	2.15	27.16	58.03	2.46	31.10	66.44
28	" "	Bolgheri	"	722.7	1.210 + 16° C	14.45	2.18	28.50	54.87	2.55	33.32	64.13
29	Great beans (Faba vulgaris)	M. Gherardesa, W.	"	673.2	1.100 + 10° C	13.71	2.97	23.98	59.34	3.44	27.79	61.77
30	" "	M. Cao di S. Marco	"	686.6	1.110 + 16° C	13.98	2.62	25.75	58.27	3.02	29.72	67.26
31	Average beans	M. Gherardesa, W.	"	743.3	1.14 + 16° C	14.86	2.95	26.14	56.05	3.47	30.71	65.82
32	March beans	Scandell	Padri Benedettini	824.9	1.21 + 16° C	12.82	2.65	24.18	60.21	2.88	28.30	69.82
33	" "	Laterna	M. Rosi, B. Antonio	769.6	1.250 + 19° C	13.52	2.52	24.75	60.21	2.88	28.30	69.82
34	Winter beans	Plantavigne	"	791.8	1.250 + 16° C	13.50	2.60	25.30	58.70	2.89	29.58	67.86
35	" "	Laterna	"	820.6	1.170 + 19° C	13.26	2.50	25.66	58.83	2.59	29.58	67.86
36	Black vetches (Vicia sativa)	Plantavigne	M. Gherardesa, W.	863.6	1.250 + 16° C	13.56	2.35	21.73	62.46	2.60	25.14	72.26
37	White vetches	Bolgheri	"	863.7	1.310 + 19° C	13.66	2.20	26.66	58.84	2.52	30.50	68.98
38	" "	Laterna	M. Rosi, B. Antonio	833.7	1.190 + 16° C	13.60	2.40	22.11	62.27	2.99	25.42	71.59
39	Great vetches, or Vecdoni	"	"	853.7	1.29 + 17° C	13.54	2.70	24.30	59.46	3.12	28.11	68.77

The localities of Bolgheri are in the Tuscan Maremma. Monteverchi, St. Giovanni, Laterna, Plantavigne, are the localities of Val d'Arno, near Arezzo. The specific weight has been determined by the method of F. J. J. Berthelot. The difference of the amount of substances not containing water has been determined by determining the amount of ash by Pellet's method, in the ratio of 15 to 100 of ash to 100 of albuminous matter. The difference of the amount of substances not containing water has been determined.

- 416.**—263. ANZALONE, FRANCESCO, *Catania*.  
Rose kidney beans, with yellow button.  
Black do.  
Rose do.  
White do.
- 417.**—360. CARBONE, FRANCESCO, *Catania*.  
White kidney beans from Malta.
- 418.**—366. COSTANTINO, GIUSEPPE, *S. Marco dei Corvoti (Benevento)*.  
Kidney beans.  
Chick peas.  
Peas.  
Lentils.  
Beans.
- 419.**—376\*. FIAMMINGO, SALVATORE, *Giarre (Catania)*.  
Mascali beans.  
Kidney beans of various qualities.
- 420.**—298. LAI, LUIGI, *Lanusei (Cagliari)*.  
Kidney beans of different kinds.
- 421.**—317. MONTERISI, GIUSEPPE, *Bari*.  
Biscaglia peas.  
Do. lentils.
- 422.**—2132. NASI, GIOVANNI, *Ferrara*.  
Kidney beans called Camerino.  
Do. Lanchino.  
Do. red amaranth.  
Do. Queen's white.
- 423.**—325. PALUMBO, ORAZIO, *Trani (Bari)*.  
Kidney beans.  
Beans.  
Lentils.
- 424.**—328. PANTANO, FRANCESCO PAOLO, *Assaro (Catania)*.  
Chick peas from Assaro.
- 425.**—330. PASI, GIOVANNI, *Ferrara*.  
Kidney beans, various qualities.
- 426.**—393. PATERNÒ-CASTELLO, Marquis of S. GIULIANO, *Catania*.  
Peas.  
Lucerne.
- 427.**—334 bis. PITTAU, FRANCESCO, *Santuri (Cagliari)*.  
Beans.
- 428.**—334. PITTAU, MAURO, *Cagliari*.  
Common chick peas.
- 429.**—339. RUNDEDDU, RAFFAELE, *Selargius (Cagliari)*.  
Chick peas.  
Peas.  
Beans.
- 430.**—278. SANT' ANNA (HERMITS OF), *Acì-Reale (Catania)*.  
Prince chick peas.  
St. Anne beans.  
Do. white kidney beans.  
Do. prince chick peas.
- 431.**—340. SANNA, VINCENZIO, *Selargius (Cagliari)*.  
Beans.
- 432.**—342. SAVONA (LOCAL EXHIBITORS' COMMITTEE OF).  
Dry vegetables.
- 433.**—345 bis. STEFANELLI, PIETRO, *Florence*.  
Vegetables chemically analysed.  
(See the table, page 105.)

## § 3. FODDER AND GRAIN USED AS FODDER.

Amongst the grain used for fodder there are many sorts which serve for the food of man and which are found amongst the cereals and the vegetables, especially in those extremely miscellaneous collections which it was wished to keep entire under the names of their respective exhibitors. The articles here represented in this special category of forage are very far from representing the total produce of Italy, as this produce is extremely rich and carefully attended to in many parts. In Lombardy it is the immediate result of the irrigated plains; beyond that region and in many others which belong to the great valleys and to the plains of the central and southern regions of the Peninsula, excellent fodder is raised upon the plateaux of the mountains, which sustain numerous flocks. Indeed, in every part where agricultural improvement makes progress the production of fodder is increased, the methods of drying and keeping are improved; and clover, lucerne, sainfoin, tuberous roots, beet-roots, potatoes, &c., become a valuable source of profit.

The acorns of the oak, or holm-oak, the last of which are abundant in all the southern and littoral districts, serve to keep numerous herds of swine, or for tanning.

**434.**—883. AYMERICH, IGNAZIO,  
*Cagliari.*

Acorns of oak and cork tree.  
Acorns of holm-oak.  
Fruit of *Celtis australis*.

**435.**—279. CELI, ETTORE, Prof.,  
*Modena.*

Collection of the seeds of the most common forage plants of the province of Modena.

**436.**—291. FIORENTINI, GIOVANNI, *Castrocaro (Florence).*  
Sainfoin seed.

**437.**—304. MAJORANA, BROTHERS,  
*Catania (Florence).*

Oak acorns (*Quercus Robur*, *Q. pedunculata* from Etna).

Acorns of holm-oak.  
Stone Pine kernels (*Pinoli molesi*).

**438.**—321. NATOLI-AJELLO,  
DOMENICO, *Patti (Messina).*  
Spanish sainfoin seed.

**439.**—322. NIEDDA DI S. MARGHERITA, *Cagliari.*  
Sorgho for fodder (stalks).

**440.**—393\*. PATERNO' CASTELLO, BERNARDO (Marquis of St. Giuliano), *Catania.*  
Pois Michaux.  
Lucerne seeds.

**441.**—2121\*. ROMEO, LINO, *Acquaviva (Bari).*  
Aniseed seeds of 1861, £16 11s. the kilogramme.

## § 4. DRIED FRUITS.

Dried figs, whether entire or cut, single or joined in pairs, or collected in loaves, and flavoured with various ingredients, prunes (*Prunus domestica*), cherries (*Cerasus vulgaris*), pears, apples, peaches, and all kinds of fruit preserved with sugar, chestnuts, almonds, walnuts, nuts, Pistachio nuts, stone pine kernels (*Pinus Pineae*), the caroba fruit (*Ceratonia siliqua*) are productions largely used for home consumption, and sometimes large quantities are exported from various parts of Italy, but especially from Sicily, Sardinia, and from the southern provinces of the continent. The Stone Pine kernels come chiefly from Tuscany, and from the province of Ravenna. Chestnuts, of various kinds, some yielding flour, and others eaten in the natural state, are gathered largely in the mountainous districts up to a certain elevation, and are a source of revenue of the first class, amounting by themselves to at least six millions of hectolitres.

We may add here dried mushrooms, of which Varese di Chiavari prepares some splendid specimens with the *Boletus edulis*, and inferior products come from other parts of the mountainous districts.

**442.**—267. BELTRANI, GIUSEPPE, *Trani (Bari)*.

Dried figs, common and selected.  
Do. raisins.  
Armellines, or apricot kernels.  
Sweet and bitter almonds.  
Olives.

**443.**—282. CHERICI, CLELIA, *Borgo S. Sepolcro (Arezzo)*.

Edible roots of *Carlina acaulis*.  
Walnuts, hazels, chestnuts, and  
other fruits candied in sugar.  
Fruit of *Arbutus* (Corbezzole).  
Alcohol of do.

**444.**—284. CONSIGLIO, M., *Lentini (Noto)*.

Almonds.

**445.**—306. CRIPPA, IDA, *Florence*.

Stone pine cones.  
Stone pine kernels.  
Stone pine kernel oil.

**446.**—373.\* DEL' ERMA, VINCENZO, *Castellana (Bari)*.

Dried figs of 1861, at 4d. the kilogramme.

**447.**—370.\* DE LUCA, PASQUALE, *Catania*.

Pistachio nuts from Bronte, on Etna.

**448.**—287. DI NISSA, MARQUIS GIOVANNI, *Cagliari*.

Sweet and bitter almonds.  
Beans.  
Stone pine cones.  
Stone pine kernels.  
Carob pods.

**449.**—378\*. FORLÌ (SUB-COMMITTEE).

Almonds.

**450.**—379\*. GARAU CARTA, LUIGI, *Sanluri (Cagliari)*.

Almonds of various qualities.

**451.**—294. GRASSI, ANTONIO, *Catania*.

Almonds.

**452.**—298. LAI, LUIGI, *Lanusei (Cagliari)*.

Dried figs.  
Dried prunes.

**453.**—301. LIPARI (LOCAL EXHIBITORS' COMMITTEE).

Dried raisins.  
Capers.

**454.**—307. MARINI DEMURO, TOMMASO, *Cagliari*.

Dried figs from Bosa.

**455.**—312. MELONI, A. *Quartu (Cagliari)*.

Dried figs.  
Dried raisins.

**456.**—319. MOSCERO, GIOVANNI, *Cosenza*.

Dried figs.

**457.**—395. PASCAZIO, VITO, *Mola (Bari)*.

Carobs (*Ceratonia siliqua*).

**458.**—332. PICCALUGA, GIUSEPPE, *Cagliari*.

Pistachio nuts (*Pistacia vera*) cultivated in the territory of Cagliari.

**459.**—491. SALERNO (SUB-COMMITTEE OF).

Dried figs, two qualities.  
Dried pears.  
Chestnuts.

Aniseed and coriander are a considerable and highly estimated production in certain localities, in the Bolognese, and especially in the province of Forlì, and also in the southern provinces. They are cultivated on the tertiary hills in these places, and on the argillaceous and fossiliferous soils.

**460.**—375\*. B. FANTINI, *Bertinoro (Forlì)*.

Aniseed.

**461.**—299. LEGA, MICHELE, *Brisighella (Ravenna)*.

Aniseed.

**462.**—310. MAZZURANA, FELICE, *Trento*.

Cummin-seed.

**463.**—324. PAGANELLI, LODOVICO, *Castrocaro (Forlì)*.

Anise and coriander seed.

**464.**—2240\*. PASQUI, GAETANO, *Forlì*.

Hops.

**465.**—335. QUERCIOLO, BROTHERS, *Modigliana (Florence)*.

Aniseed.

## SECTION II.

### ARTICLES SUITABLE FOR FOOD, PRESERVED OR OTHERWISE.

#### § I. FLOUR.

The grinding of grain, vegetables, and chestnuts is performed generally by the common mills, having one or several millstones, moved by water power. Windmills are rare in Italy. In several places offering favourable conditions, the grinding of wheat is now performed by large mills, which do not work on a small scale, for individual consumers, but for the wholesale wants of bakers and of commerce. In these mills, steam is employed, either as an auxiliary to water, or as the principal motive power, at least in summer time, the engines being of 20 or 30 horse power. There are five or six, or more millstones to each motive power. The millstones made use of, either in the common mills or in the great grinding establishments, are generally brought from abroad, chiefly from France, (from La Ferté quarries) sometimes from Italy, whence the granites of Lake Maggiore, the quartzites of Verrucano (Pisa), the coarse-grained euphotides of Montferrato, near Prato, in Tuscany, different breccias and basalts furnish stones which are much esteemed. (See page 67, Nos. 178, 179, 180.) The millstone of the ancients, spoken of by Pliny as a limestone, is perhaps only a calcareous *alberese*, of which millstones are now made in some places.

The modes of grinding vary considerably, according to the nature of the substance to be ground, as wheat, barley, vegetables, maize, chestnuts, &c. In the common mills the millstones are of great diameter and little velocity, where the flour is obtained by bolting cloths, necessarily of a variable size. In the great mills the grinding is performed by the mode more generally known under the name of the French system; but the Anglo-American system is also practised, from which excellent flour is obtained when due care is employed in the process.

The screening of wheat and the bolting of flour are effected by machinery connected with the establishment.

At the first Italian exhibition of 1861 flour was shown from the Tyrol (Triente) from Venice (Vicenza, Treviso), from Piedmont, from Lombardy (Pavia), and from Tuscany. Calci, near Pisa, is justly celebrated for the number of its mills, which furnish flour not only for inland consumption, but also for exportation. It is a very convenient locality, owing to the water which is made available there, the proximity of the railroad, which connects it with Florence, Pisa, Lucca—all central places of consumption and of competitive markets for the wheat of the country—and with Leghorn, also a large place of consumption, and a port of arrival for foreign wheat, but still greater for exportation. From Calci the flour of M. Gaetano Biscioni has for a long time maintained a rivalry with the French flour even at Algiers. Those of M. Casali have been purchased at an enhanced price even in England, by the house of Haylock,

for the manufacture of biscuits, and those also of MM. Tellini and Corridi are invariably splendid products.

From 80 to 75 kilos and even less of flour are obtained from 100 kilos of wheat according to the quality.

From the experiments of M. Fausto Sestini, a young chemist of Florence, two sorts of very fine wheat of different qualities dried at 100 contain in 1,000 parts:—

Gluten.....	102.20 to 119.32
Azote .....	10.38 to 30.40

Whilst the common flour of

	WHEAT.	
	Marianople.	Native.
Containing gluten .....	149.19 ..	115.39
„ azote .....	25.39 ...	17.03

And finally two sorts of flour, one of superior brand, the other common, have given

	Superfine.	Common.
Containing gluten.....	147.64 ...	116.09
„ azote .....	19.14 ...	21.67

In the establishments of acknowledged reputation, 20 to 80,000 hectolitres of wheat are annually reduced to flour.

The various sorts of maize flour contribute essentially to the sustentation of the public, and hold an important place in the inland trade, and are found to be adapted, especially in Lombardy, for exportation to Switzerland.

Chestnut flour, used under the form of polenta, is the basis of the food of the montagnard population. The flour of vegetables, of barley, and of rye are of much less importance. Black wheat, buckwheat (*Polygonum Fagopyrum*), is much consumed in the Valtellina, where large quantities are produced. (See page 85).

**466.—274. CASALI, ANTONIO, Calci (Pisa).**

Wheat.

Fine flour obtained from the same wheat.

**467.—280. CHELLI, FRANCESCO, Leghorn.**

Starch prepared by a new process.

**468.—467\*. CICHESSE, PASQUALE, Campobasso (Molise).**

Fine flour from Carosella wheat, at 5d. the kilogramme.

**469.—289. DROUIN, GIORGIO, Naples.**

Wheat flour.

Bran.

Bread.

**470.—301. PALUMBO, PASQUALE, Cava (Salerno).**

Potato starch.

Starch from *Arum italicum* and *Pancratium maritimum*.

Dextrine prepared from potato starch, 2nd quality.

Dextrine prepared from potato starch, 1st quality.

**471.—337 bis. RE, CARLO, Pavia.**

Flour.

Small semola.

Semola.

**472.—343. SCHLAEPFER WERNER AND Co., Salerno.**

Potato starch.

Starch gum.

Lejocome.

Baked starch.

Dextrine.

**473.—346. TARDITI AND TRAVERSA, BROTHERS, Turin.**

Five qualities of starch of native wheat.

Three qualities of semola of hard Russian wheat.

**474.—347. TELLINI, V., Calci (Pisa).**

Fine wheat flour.

## ITALIAN PASTES, BREAD, BISCUITS.

The name of Italian Pastes, given to all kinds of articles made of flour, is a sufficient eulogium of their quality. Hard wheat is the basis of their manufacture, owing to the plastic character which the semola acquires when it is ground under the action of heat and humidity. The origin of this preparation may be traced in the *concoction* of the Arabs. As regards the manufacture of Vermicelli, in 1838 the city of Genoa alone contained 71 establishments, and exported 2,370,000 kilogrammes of its produce to Paris, London, to the East, and to America, to which places the products of Naples and Leghorn were in the same manner despatched.

Some modifications effected in the fiscal relations of ancient Piedmont with the other States of the Peninsula, inflicted a serious injury upon the Genoese trade, which, however, is at this time more flourishing than ever, as the Vermicelli manufacturers have used from 450 to 500,000 quintals of wheat during the last three years. Notwithstanding this enormous development of the Genoese manufacturing industry, paste is made in all parts of Italy, with more or less perfection. But, with regard to colour, consistency, and the power of swelling out without bursting in the boiling, the paste of Genoa, of Tuscany, and of Sicily is the most remarkable. Various qualities of a more or less fine description are made, some of a brown colour and very common, of all sorts of forms, from *la neve*, which resembles snow-flakes in its fineness, to those large pipes, with a hollow of about an inch; to suit certain tastes, some paste is coloured with saffron and turmeric, which it must be admitted is not an improvement in this art.

The description of wheat employed in the manufacture of paste is the hard wheats of Odessa and Taganrog; but Sicily and Apulia grow also wheat of excellent quality, which is used with the greatest success in obtaining a perfect and cheap article.

The last researches concerning the common paste of commerce from Tuscany, show that they contain from 14 to 15 per cent. of water, and from 0.82 to 2.29 of azote.

To the business of baking, or the White art (*Arte bianca*) exercised in all its branches, unfettered by any restriction or exclusive privileges in Italy, are connected not only the flour and paste business, but the making of common bread, biscuits, and a number of varied products which it is difficult to distinguish from that of pastry, properly so called.

Household bread, especially in the country, is prepared sometimes with flour of pure wheat, but often with a mixture of wheaten flour and that of various other kinds of vegetable products.

The bread sold by bakers is made from pure wheat, and in different-shaped loaves, from the common white bread, fancy bread, *Grissins* of Turin, the bread of German origin; *Chifel*, *Semel*, &c., up to the hard bread, or *granolato* which is preferred in many of the localities of Northern Italy, and the soft bread, which is in more general consumption.

The article of bread itself only appears in the Exhibition in an insignificant form. There are more biscuits, of shapes peculiar to certain places, or in imitation of the English *arrowroot biscuits*, picnic biscuits, New York biscuits, ginger nuts, the manufacture of which has been introduced with an unanticipated success by G. Guelfi, at Pontedera, near Pisa, in Tuscany, since 1854, by means of the *Marca Regina* of M. Casali.

In this category we may also rank the *Cantucci di Prato* biscuits, with aniseed, dry and pressed into shapes, but very light; those of Porto Ferrajo, in the island of Elba, Novara, and Sardinia, softer, flavoured with aniseed, and coloured yellow; the *Panatlone* of Milan, candy loaf, which may be kept during long voyages; the *Buccellato* of Lucca, the *Ciambellone* of Sienna, the *Roschette*, the *Pan forte* of Sienna, which creates a business of some importance about Christmas time.

## PASTE.

475.--448\*. ASTENGO, CRISTOFORO,  
*Savona (Genoa).*

Paste and Vermicelli.

476.—400. BELLENTANI, G.,  
*Modena.*

Paste (hand made).

Tagliatelli.

Tortellini.

Cappelletti.

Quadretti.

477.--401. BENEDETTI, BROTHERS,  
*Faenza.*

Paste of groats, machine made, 1st,  
2nd, and 3rd qualities.

The hard wheats are from the neighbourhood of Faenza; 18 to 24 workmen.

The prices are fixed as follows:—

1st quality.....	8d.	the kilogramme
2nd     "     .....	7d.	"
3rd     "     .....	5d.	"

- 478.—402. BIANCHI, BROTHERS,**  
*Lucca.*  
Paste of groats.
- 479.—464\*. CASERTA (SUB-COMMITTEE OF),** *Terra di Savoro.*  
Maccaroni.  
Vermicelli.
- 480.—462. CAGLIARI (SUB-COMMITTEE OF).**  
Various confections and paste, from Cagliari.  
Vermicelli.  
Andarinus.  
Gentilla.  
Pisu de Meloni.  
Pibireddu.  
Canotiglie.  
Maccaroni, first and second qualities.
- 481.—406. CESARI, LUIGI,** *Naples.*  
Collection of pates.
- 482.—468\*. CICCHESE, Rocco,** *Campobasso (Molise).*  
Italian paste, maccaroni, first quality, 5d. per kilogramme. The price is reduced in the seasons of regular production.  
Semola and little semola of Saragolla wheat, 4d. per kilogramme.
- 483.—469\*. CIOPPI, LORENZO AND SETTIMO, BROTHERS,** *Pontedera (Pisa).*  
Paste for soup.
- 484.—496\*. DAMIANI, CRISTINO,** *Portoferraio (Elba).*  
Biscuits with aniseed, *Cantucci di Portoferraio.*
- 485.—475\*. FOGGIA (SUB-COMMITTEE OF).**  
Prepared paste, hand-made.  
Do. machine-made.
- 486.—571\*. DE GAETANO,** *Filippo, Gallico (Calabria Ulteriore I.).*  
Maccaroni and vermicelli.
- 487.—(Wanting).**
- 488.—481. LEMBO, PIETRO ANTONIO,** *Minori (Salerno).*  
Thirteen qualities of fine paste.  
Twelve qualities of long paste.
- 489.—489\*. MARINELLI, EMILIO,** *Parma.*  
Italian paste.
- 490.—431. PAOLETTI, FERNANDO,** *Pontedera (Pisa).*  
Cooking paste, natural.  
Do. with saffron.  
English biscuits.  
New York biscuits.  
Fine flour.
- 491.—432. PAOLETTI, GIUSEPPE,** *Pontedera (Pisa).*  
Paste for cooking, of various qualities.  
English biscuits.  
Cantucci (biscuits).  
  
The manufactory of M. Paoletti has been at work for 15 years; it employs 30 workmen, and a machine which performs the work of seven men. He produces 1,000 kilogrammes of paste every day, and has commercial relations with the other provinces of Italy, and with foreign countries, especially with France and America.
- 492.—442. SPANO, LUIGI,** *Oristano (Cagliari).*  
Bread.  
Paste.  
Maccaroni.  
Preserved orange-peel.  
  
BISCUITS.
- 493.—454\*. BERNARDI, BROTHERS,** *Borgo a Buggiano (Lucca).*  
Biscuits unaffected by change of season.

**592.**—456.\* **BIFFI**, **PAOLO**, *Milano*.  
Panattoni from Milan.  
Comfits.

**593.**—495.\* **CAMPOBASSO** (SUB-COMMITTEE OF).  
Biscuits.

**594.**—463.\* **CAPASIO**, **P.**, *Benevento*.  
Benevento torrone.

**595.**—478.\* **GALASIO**, **G.**, *Benevento*.

Benevento torrone, made with honey, pistachio nuts, almonds, and many aromatic essences.

**596.**—416. **GUELFI**, **GAETANO**, *Cascina (Pisa)*.  
Various qualities of biscuits, English fashion.

**597.**—499.\* **MATTEI**, **ANTONIO**, *Prato*.  
Biscuits with aniseed (Cantucci).

**598.**—433. **PAOLETTI**, **OTTORINO**, *Pontedera (Pisa)*.  
Cavour biscuits.

## § 2. MEAT, FISH, VEGETABLES, SALTED OR PRESERVED.

If the preservation of animal and vegetable substances which furnish articles of food are sometimes more adapted to satisfy particular tastes than the real wants of life, on the contrary, in other cases, they furnish very important resources, whatever may be the more or less complicated means which are employed to make them, and whatever may be the nature of the substances preserved.

Drying, the most simple amongst the known methods, is also the most generally adopted amongst the least civilized people; it is employed amongst us to preserve grain, fodder, fruit, far more than meat and animal substances, excepting, however, cheese.

Next, salting, sometimes combined with drying, sometimes, on the contrary, with the permanent action of water, so that there is dry-salting, or salting properly so-called, and salting in brine; the former gives us the greatest number of preserved alimentary substances, such as numerous sorts of vegetables, fruits, mushrooms, &c., amongst the vegetable class; fish, meat, and the fat of different animals. Lastly, particular liquids, such as vinegar, oil, alcohol, syrup, exerting a power according to their peculiar nature in resisting the causes and progress of putrid fermentation, serve also to preserve many animal substances for alimentary purposes without affecting injuriously their primitive substance, so as to render them insusceptible of putrefaction, or conferring a noxious power upon them by the addition of deleterious principles. The abstraction of air, in whatever manner it may be effected, and that it may operate either by removing the oxygen from the contact of putrescible substances, or in destroying the germs of organisms, which by experiments altogether new in science, appear to perform a most important part in fermentation, is a very common and much practised method, in certain applications; whilst it is regulated in others by complicated processes, based upon principles of the highest scientific character, though it results in preserving substances of every description, changing in the smallest possible degree the natural state, and on that account possessing very great advantages over all the other modes of preparation as applicable to food.

By whatever process means are taken to prepare substances for preservation, and for purposes of food, a very important business is carried on, not only in a sanitary but an economical point of view, which is illustrated by a multitude of articles of produce, which are generally pretty extensively consumed abroad, in some instances, and in others are altogether confined to certain localities, according to the natural conditions from which the produce, substance, or the means are derived, or according to the taste and demands of commerce.

We have to direct our attention at present to the vegetable substances which are preserved by drying, if it only refers to some few fruits; no meats are preserved by simple drying; we shall see elsewhere preparations with sugar, alcohol, and we shall now record in this place every other article dried or preserved of a vegetable or animal nature. Besides the fruits, dried vegetables, there are dry-salted vegetables, mushrooms, but above all excellent and exquisite olives, which are prepared especially in the south, with the fine variety of olive called *grossa de Spagna*.

Upon the whole coast of Italy, or in the islands from May to September, they catch and prepare with salt, &c., excellent anchovies (*Clupea spractus*), and sardines (*Clupea encrasicolus*), the production of which varies a great deal in quantity, according to the circumstances of each year, and these articles are also prepared in a superior manner.

This produce is generally sold in casks of about 60 kilos., at prices varying with the season, from about £3 to £6 the 100 kilogrammes.

The tunny, mackerel (*Scomber scombrus*) are also cured in like manner, but in a dry-salted state; or rather it is the roe of the tunny, (*Scomber thynnus*), or of the mullet (*Mugil cephalus*) which is cured in Sardinia and Sicily, under the name of *Pottarga*, *Pottarga di tonno*, *Pottarga di muggine*, which is at least as good as that from the coast of Africa. In this manner Sardinia, in the neighbourhood of Oristano alone, can count upon 200 kilos. of *Pottarga*, at from 1s. 8d. to 2s. 1d. the kilogramme.

Pork, however, furnishes the greatest quantities of salted provisions. Various breeds and varieties of pigs are kept (amongst them a red sort, very common in the Apennines), some black, others white and black, more or less easy to fatten, capable of attaining a considerable weight, and which are completely fit for killing when two years old. There are some sorts half wild, and of diminutive size in the Maremma, which furnish an excellent meat. The pigs are fed with all sorts of vegetable and animal matter, fluid and solid, and in every locality. For salting, the flesh of those animals which come from the hills and mountains, where they feed upon chestnuts, acorns, and maize, is preferred; and the pigs which are destined for the finer kinds of salt pork are placed by some salt curers upon a certain course of fattening.

Romagna, Emilia, and Lombardy, claim in Italy an undisputable superiority in the variety and quality of their salt provisions. It is superfluous to describe their hams, which have nothing to be desired, excepting a name, which they sometimes borrow from Westphalia and Hungary; their flitches of bacon are equally esteemed. The *cojpe* or *capocelli* are the prime pieces of the shoulder or the leg, which are salted and enclosed whole in a bladder or skin; others, and indeed the most numerous, as the sausages, (*salami*) of Florence, the *mortadelle* of Prato, those of Bologna, the *salami* of Verona, are made of pork, carefully chopped, having certain proportions of fat and lean intermingled with beef in the *mortadelles*, seasoned with pepper and spices. The chopping is generally done by hand, but in some houses chopping machines are used.

In a similar way, but with care in the selection of meat—with the addition of a quantity of bacon, the outer coverings being also carefully selected, which are as usual the bowels, or the skin of the flanks, or the leg deprived of the meat and bones as far as the ends of the toes—and carefully adjusting the quantity of seasoning, the *cotechini*, the *zamponi* of Modena, and the *salami* of Ferrara are prepared for market.

On account of their flavour and the superior quality of the materials used, as well as that of keeping for a long time, salt provisions form a large portion of the inland consumption. Some foreign produce of similar kinds are with difficulty brought into competition with them in the country, and as articles of luxury. Besides this, some of the salt provisions of Italy are articles of exportation to different parts of Europe, America, and Africa.

Their preparation in the salting houses of so extensive a producer as Bellentani, requires a consumption of upwards of 2,000 quintals of fresh meat, of which 100 kilogrammes alone, without counting flavouring ingredients (pepper, spices,) and saltpetre, require 2,720 kilogrammes of salt.

#### VEGETABLES AND SALT FISH.

##### 501.—414.\* GATTI, ALESSANDRO, Cosenza.

Many descriptions of mushrooms prepared in pickle.

Salt mushrooms.

##### 502.—482.\* LOFARO, BASILIO, Reggio (Calabria).

Pickled olives.

##### 503.—483.\* MELISSARI, FRANCESCO SAVERIO, Reggio (Calabria).

Pickled olives.

##### 504.—426.\* MILAZZO (SUB-COMMITTEE OF), Messina.

Pickled sword-fish.

Do. sardels.

Do. olives.

Do. tunny.

**505.—423.\* MAJORANA. BRO-  
THERS, Catania.**

Salted artichokes.  
Do. capers.  
White olives.  
Black do.  
Mustard and starch.  
Mustard with almonds and walnuts.  
Simple mustard.

**506.—462.\* CAGLIARI (SUB-COM-  
MITTEE OF).**

Tunny eggs.  
Mullet eggs (Pottarghe).

The tunny fishery is carried on in Tuscany near Grosseto, Orbetello, Piombino, and the Islands of Giglio and Elba; 267,470 kilogrammes of fish are there collected.

Sardinia has fisheries at Porto Paglia, Portoseuro, Isole Piane, Cala Vinagra, Cala Saponi, Frumentargiei, and at the Salt-works. 992,000 kilogrammes are prepared of tunny with oil, and 50,800 kilogrammes of the back of the tunny pickled.

Sicily has 22 tunny fisheries, frequented by 15 boats each.

In 1823, at the Sardinian Salt-works, 3,680 tunny gave a product of 367,250 francs in fish cured in various ways. The expenses of the fishery, implements, oil, men, boats, &c., absorbed 129,550 francs in such a manner that the net produce did not amount to more than £9,508.

The sardine fishery in Tuscany, carried on especially on the coasts of the Isles of Elba and Giglio, and of Orbetello, and Grosseto, produced nearly 217,977 kilogrammes of salted fish.

**507.—479.\* GIORDANO, Do-  
MEXICO, Cetara (Sardinia).**

Salted anchovies.

**508.—409. FANNI, FEDELE, Ca-  
gliari**

Tunny eggs (Pottarga).  
Thirteen mullet eggs (Pottarga di muggine).

**509.—442. SPANO, LUIGI, Oristano  
(Cagliari).**

Salt eels.  
Dried mullets (Moglietti).  
Pickled olives.

**510.—444. VALAZZA, GAETANO,  
Turin.**

Pickled sardines.  
Tunny preserved in boxes, Appert's process.

This tunny is prepared in Sardinia, at Porto-Torres, by means of steam boiling, and closed up in boxes in which it is preserved for an indefinite time.

The sardines are also of local preparation.

**SALT MEAT.****511.—400. BELLENTANI, GIU-  
SEPPE, Modena.**

Hams.  
Shoulders of Saint Secondo.  
Mortadella.  
Coppa.  
Florence sausages.  
Pork fat.  
- Preserved tomato sauce.

**512.—458. BOLLINI, GIOVANNI,  
Alexandria.**

Sausages of the present year.  
Bondiola.  
Hogs'-meat of the environs of Alexandria.  
Annual production 3,000 kilogrammes

**513.—459.\* BOSIO, Widow Do-  
MEXICA, Alexandria.**

Sausages of the present year.  
Sausages said to be of cooked head.  
Annual production, kil. 5,000 hogs' flesh, from the neighbourhood of Alexandria.  
(Zampino) 3s. to 3s. 4d. the kilogramme.

**514.—405. CALDERAI, ANGELO,  
Florence.**

Refined sausage.  
Sausages without garlic.  
Mortadella with fennel.

**515.—408. DRAGHI, DOMENICO,  
Viastino (Piacenza).  
Salt meat (Coppa).**

**516.—410. FERRARA (R. CHAMBER OF COMMERCE OF)**

Sausages.

**517.—476.\* FORLÌ (SUB-COMMITTEE OF)**

Sausages.

**518.—411. FORNI, ALESSANDRO, Bologna.**

Mortadella of Bologna, weight kil. 9.50.

Sausages.

Capocollo, or summer coppa.

**519.—417. JACINI, GIUSEPPE ANTONIO, Alexandria.**

Raw sausages of the present year.

Sausages said to be of cooked head.

Cooked Zampini.

Hogs' flesh.

Annual production, kil. 6,000; sold in the neighbouring provinces and in France. Value £800.

**520.—418. LAMBERTINI, GIUSEPPE, Bologna.**

Mortadella of Bologna.

Capocollo, or summer coppa.

Sausages.

**521.—480.\* LANZARINI, ANGELO AND BROTHERS, Bologna.**

Mortadella of Bologna.

Coppa or capocollo.

Fine sausages.

Zamponi.

Coteghini.

Bondiole.

**522.—426. MILAZZO (LOCAL EXHIBITORS' COMMITTEE) (Messina).**

Various salt provisions.

**523.—430. ORSI, RAFFAELLO AND Co., Bologna.**

Mortadella of Bologna.

Mortadella is prepared with the flitch and gammon of bacon, brayed, and seasoned with salt, spices, garlic, and strong-bodied wine.

**524.—436. RAINOLDI, GIOVANNI, Milan.**

Twelve assorted sausages.

Salted and smoked pieces.

Slices partly cooked, and preserved in boxes of tin plates.

**525.—490. REGGIO (AGRICULTURAL COMMISSION OF) Emilia.**

Pork ham.

Gammon of pork.

Coppa of pork.

Sausages.

**526.—491.\* SALERNO (SUB-COMMITTEE OF)**

Mortadella of Cilento.

**527.—440. SAMOGGIO, GAETANO, Bologna.**

Hogs' lard, weighing 65.50 kilogrammes.

**528.—446. ZANETTI, GUIDO, Bologna.**

Mortadella of Bologna.

Coppa or capocollo.

## ALIMENTARY PRESERVES.

**529.—466.\* CARPANETO AND GHILINO, Genoa.**

Preserved food (Appert's process).

Preserved fruits.

**530.—403. BOSCARELLI, ANGELO, Cosenza (Calabria).**

Preserved larks.

**531.—419.\* LANCIA, BROTHERS, Turin.**

Smoked meat.

Prepared salt provisions.

Lard prepared for armies.

Various alimentary preserves.

**532.—425.\* MARINI-DEMURO, DOMENICO, Cagliari.**

Extract of tomato.

**533.**—487.\* PASCALIO, VITO,  
*Noto (Bari).*

Tomato sauce of 1860, 1s. 3d. the kilogramme.

Figs dried in the sun, 5d. the kilogramme.

**534.**—488.\* RAMIREZ, GIOVANNI,  
*Reggio (Calabria).*

Preserved tomatos; price 10d. the bottle.

**535.**—441.\* SONA, C., *Alexandria.*  
Mustard as a kind of preserve.

VINEGAR.

Vinegar is used also to preserve some animal substances, above all the tunny, and for the marinades of small fish and eels (*Muraena anguilla*) of which the fish is very plentiful at Comacchio. It is known that the ponds of that country occupy a space of 30,000 hectares, and might yield from seven or eight

millions of kilogrammes of fish. They are situated conveniently for the breeding of young fish, which ascend to these lakes every year from the sea, during the months of February until April; we ought to add that an extraordinary mortality amongst the fish has been observed since 1825, and that in 1854 the lake itself was reduced to one-half.

Many vegetables are also prepared with vinegar; capers (*Capparis spinosa*); long pepper (*Capricum annuum*); pumpkins, melons, and water melons gathered before their maturity, etc.

**536.**—475.\* FOGGIA (SUB-COM-  
MITTEE OF)

Capers in vinegar.

**537.**—486.\* PALUMBO, ORAZIO,  
*Trani (Bari).*

Olives from Andria.

Common black olives.

Preserved tomatos.

§ 3. CHEESE AND BUTTER.

Certain Italian cheese is well known abroad, such as the Parmesan or Lodisan (*cacio parmigiano, cacio lodigiano, cacio di grana*), the making of which in Lombardy constitutes one of the most important sources of profit, and is connected from its nature with the system of irrigated plains which are called *marcite*. Cows' milk is of course used for making cheese of the first quality, but amongst those made beyond the district of Parmesan it is proper to distinguish several sorts, according to their particular production and the method employed in making them. These cheeses are soft or new, salted or otherwise, dry or hard.

Amongst the soft cheeses, there are in Lombardy, in the lower parts of Piedmont, in Emilia, as far as Modena and Ferrara, the *Stracchini*, distinguished as poor or ordinary cheeses, and *Stracchini* of double cream. (*Stracchino di due panne, Robbiole, Crescenza, Formagelle, &c.*) These are very rich, mild cheeses, of a delicious flavour when eaten quite new; they have their analogues in the cheeses of Vézé, Neufchâtel, and Montdidier. The common *Stracchini*, slightly salted, keep some time, but with an additional quantity of salt they become articles of commerce which are called *Giorgine* and *Beltermat*; their flavour resembles in some respects the cheeses of Brie, Marolles, and Lincolnshire.

The Gorgonzola *Stracchini* are salted cheeses, very rich, and much esteemed.

Amongst the hard cheeses there is the *cacio cavallo* of the Basilicata, of the Calabrias and Sicily; this is cheese made from a hard curd, somewhat springy, very savoury, and slightly fermented.

These cheeses are made in various forms—square, round, or flat—and frequently of shapes but little adapted for keeping, and for the advantageous disposal of the article. Sometimes a hole is made in these round or oval cheeses, which is filled with butter at the time of their preparation (*provole*). Others are flavoured with spices and pepper, according to the taste of the country.

But the most important cheese in Italy is the *grana* of Lombardy, that is to say, the Parmesan or Lodisan. These are represented in the Gruyère cheeses in point of quality and make, and are made of cows' milk boiled hard. This produce, which is imitated in Piedmont, Emilia, Tuscany, and in some parts of Sardinia, is prepared in the dairies, *Casine* or *Bergamine*, which often contain more than a hundred milch cows; and the associations of small farmers who adopt the Swiss system, send their milk to a common entrepôt, and receive in return a proportional quantity of produce.

The *grana* cheese is distinguished into *maggenga*, made from April to September, and the *invernengo, terzuolo, or terzaruolo*, made from the month of September to April; this is poorer in quality and less esteemed than the former.

We here give, after known analyses, the composition of the *grana* cheese:—

Water.....	30.31
Inorganic substances.....	7.09
Substances with azote .....	35.62
Fatty matter.....	21.68

In addition to the consumption of the country, the *grana* cheese is extensively exported to Germany and the Levant, as well as to France and England. The unification of the kingdom has greatly contributed to extend its consumption in the southern provinces; doubtless a similar demand would arise in Venetia, but that Austria imposes a duty of about 20 per cent. upon this article.

The price of *grana* cheese varies according to the quality, condition, and the time it is kept in the dairies, where years are computed from six months to six months. At the end of three years (eighteen months) the average price of well kept cheese is from 1s. 8d. the kilogramme.

The provinces of Bergamo, Cremona, Lodi, Pavia, and Milan give the richest cheeses, but the great entrepôt of Lombardy cheese is Codogno, near Milan. In this place business is annually done in cheese to the value of £92,000, which is a little in excess of its own production and that of the neighbouring province of Cremona, and more than double what is produced in the Valtellina. The produce of the other provinces is much less, and it is relatively insignificant in Tuscany and Sardinia.

Cheese from ewes' milk is consumed throughout the whole peninsula, and a special reputation is enjoyed by the *caci marzolini* of the valley of the Elsa, in Tuscany, as also the cheeses called *caci di creta* from the clayey hills of Sienna, where the refractory soil produces naturally, without any kind of cultivation, a great quantity of aromatic herbs, especially wormwood (*Artémisia maritima*), which imparts a very peculiar flavour to the milk. The cheeses of Viterbo and Rome, *cacio di Roma*, made during the winter in the Tuscan Maremmas and in the Campagna Romagna, the cheeses of Aquila, of the Abruzzi, the Basilicata, Apulia, and Sicily, are very abundant, and much in demand for home consumption.

Besides cheese made from pure goat's milk, as in Mont Dore and in Dauphiny, Italy has cheese made of goats' and sheep's milk mixed, as the strong cheese of Lecce.

A cheese of buffalo milk is produced in the Neapolitan and Roman provinces; it is made into round and oval shapes, and is known under the names of *nova di bufalo*, and of *provole* and *provaure*.

The importance of the manufacture of cheese, produced principally in Lombardy and the Calabrias, may be seen from the following division:—

Cheeses from cows' milk .....	450,000 kilogrammes.
Do. sheep's milk .....	157,000 "
Do. goats' milk .....	30,000 "

The clayey soil of Sienna, in Tuscany, yields alone 40,000 kilogrammes of ewe cheese. The territory of Visso, in the province of Macerata, produces further 50,000 kilos. of cheese.

Butter is also an important product, as much for home consumption as for exportation.

The province of Cremona alone produces 4,000 quintals, and the Lombard entrepôt of Codogno adds every year 160,000 kilogrammes, representing a total value of 320,000 milanesi livres.

The curds of the first or second boiling (*ricotte* or *caciotte*) are consumed to a great extent as food for the peasantry and for the fattening of cattle. They are eaten either fresh or salted.

There are also other products of milk which are purely fanciful, and without any commercial value, such as the *mascarpone* of Lombardy, which is of a very sweet taste, being made of cream curdled by citron juice, vinegar, or a little sour milk; it is sent to table as soon as the cream is set.

**538.**—451\*. BARACCO, BROTHERS,  
*Cotrone (Calanzaro).*

Calabrian cheese of various sorts.

**539.**—450\*. BORANO, ALFONSO,  
*Naples.*

Cheese.

**540.**—452\*. BELTRAMI, PIETRO,  
*Cagliari.*

Cows' milk cheese, from the cheesery of Macomer, near Aristano.

**541.**—453\*. BERGAMI, PIETRO,  
*Ferrara.*

Cheese, three years old.

**542.—455\*. BIBIANO** (MUNICIPALITY OF), *Reggio (Emilia)*.

Cheese from Lodi, three years old.

The Bibiano cheese received the medal at the Florence Exhibition for its excellent consistency and exquisite taste. Every year 85,000 kilogrammes are produced, of the value of £5,840; the fresh, or first year's cheese, is sold at 1s. 4d. per kilogramme; after three years the price is 2s. The manufacture is collective, amongst many proprietors.

Good qualities are attributed to the milk produced on the calcareous clay marl with which the prairies are annually manured.

**543.—465\*. CASSARO, FRANCESCO**, *Giosa (Bari)*.

Common cheese.

**544.—470\*. COSTANTINO, GIUSEPPE**, *S. Marco di Cavoti (Benevento)*.

Cheese.

**545.—472\*. DE GORI, AUGUSTO**, *Sienna*.

Cheese, from Siennese sheep, of the Cretan breed.

**546.—473\*. DEMURTA, ELIA**, *Lanusei (Cagliari)*.

Cheese of three descriptions.

**547.—407. DOZZIO, GIOVANNI**, *Belgiojoso (Pavia)*.

Maggengo cheese.

**548.—474\*. FARINA, BROTHERS**, *Baronissi (Salerno)*.

Provoloni.

*Cacio cavalli*.

Annual production, 9 or 10 tons.

**549.—410. FERRARA (R. CHAMBER OF COMMERCE OF)**.

Ferrara cheese.

**550.—412. FRANZINI, B.**, *Pavia*.  
Cheese.

**551.—493\*. TRUCILLI, VINCENZO**, *Salerno*.

Buffalo cheese (provole).

Annual production, 200,000 kilogrammes.

Cheese, with butter inside a cavity in the cheese.

Annual production, 2,000 kilogrammes.

**552.—413. GABRIELE, D. A.**, *S. Barto'omco in Galdo (Benevento)*.

Cheese.

Raschi gras of February, 1862.

*Cacio cavalli*, autumn, 1858.

*Cacio cavalli*, long; autumn, 1861.

Butter of February, 1862.

Giuncate.

Curds salted.

These are cows' milk cheeses which are sold at Cosenza, Cotrone, and Naples, at the price of 1s. 8d. per kilogramme. The exhibitor owns a cow park of 100 cows, which produce about 28 *bantards* of cheese.

The *cacio cavallo* is produced with the caseiform coagulum of the previous day, by softening it with hot water. The butter is obtained from milk, which is churned by an instrument of very simple construction.

**553.—422. LUPINACCI, BROTHERS**, *Cosenza*.

Cotrone and Cosenza cheese of the autumn of 1861.

Selling price at Naples, 1s. 3d. the kilo.

Cheese of February, 1862 . . . 1s. 3d.

Cheese fresh of 1862 . . . 1s. 3d.

Do. salt do. . . . . 1s. 3d.

The flock of the exhibitor amounts to 1,500 head of sheep.

From the same milk when it is boiled and curdled the cheese is first made, and by a second process an inferior description is produced.

New cheese is prepared according to the demand for them.

**554.—421. LIUZZI, B.**, *Reggio (Emilia)*.

Loriano cheese.

**555.—426. MAJORANA, BROTHERS**, *Catania*.

Caciocavallo, long.

Do. fresh.

Do. and butter.

**556.—427. MODENA** (SUB-COMMITTEE OF)

Sheep's milk cheese.

**557.—484.\* MOSCATO, BROTHERS,**  
*Salerno.*

Caciocavallo.

**558.—434. PARMA** (SUB-COMMITTEE OF)

Cheese.

**559.—435. PETRUCCELLI, C.,**  
*Custelfranco (Benevento).*

Sheep's milk and cheese.

**560.—437. REVEDIN, C. G.,**  
*Ferrara.*

Cheese.

**561.—489.\* REGGIO** (SUB-COMMITTEE OF) *Calabria.*

Sheep's milk cheese from Palizzi ;  
price 1s. 1d. the kilogramme.

**562.—436. SAGLIOCCO, G.,**  
*Benevento.*

Cheese.

**563.—564.—494. VIVARELLI,**  
*COLONNA, Pistoja.*

Goats' milk cheese.

## § 4. SUGARS.

The cultivation of the sugar cane is abandoned in Italy, with the exception of Sicily, which produces but a small quantity of grape sugar, and recently some *sorgho* sugar, especially in the form of molasses, or syrup. This appears destined by being produced in this manner to supplant the boiled must, used to enrich the natural must of wines, which, if the grapes were better cultivated, would not require that addition. It certainly would be better to apply the *sorgho* sugar to the production of spirits.

Sugar refining has also been tried in some places, but no establishment of that kind is in active working.

## § 5. CONFECTIONARY, SYRUPS, &amp;c.

From the Tyrol to Palermo, confectionary, comfits, gum pastes, candies, marmalades, and syrups of all kinds are manufactured, in the making of which, cocoa, common almonds, nuts, cinnamon, aniseed, odoriferous plants, various fruits, and spices are used.

Some of these products are, in certain places, of peculiar forms, as the *confetti*, or comfits of Pistoja and of Foligno, the *Ossi di morto* of Perugia, the *torrone* of Cremona, the preserved peaches of Ferrara (*persicate*), the *panforti* of Sienna, to which we have already referred, and numerous sorts of biscuits, which we have pointed out as above. There are at Turin, at Florence, Foligno, and Rome, chocolate manufactories, producing annually from 6 to 10,000 kilogrammes. Turin, Genoa, Leghorn, and Palermo have, on the other hand, manufactories of comfits, producing a million of kilogrammes each; and the articles there produced, especially oranges, candied citrons drawn almost entirely from the south, and from Sicily, are exported to Amsterdam, St. Petersburg, Hamburg, Berlin, New York, and Philadelphia. In short, Milan, Turin, Genoa, Naples, and Palermo are famous for every sort of exquisite confectionary.

The gum pastes leave nothing to be desired in the way of design or as regards quality and colour, which is never of a metallic origin; they complete the productions of the art of Italian confectionary, adding to the ordinary products ornaments agreeable to the eye, with forms of well-imitated flowers and well-designed arabesques; they are made with much taste in Trent, Leghorn, Florence, and Palermo.

**565.—449\*. BARBETTI, SANTI,**  
*Foligno (Ombria).*

Chocolates.  
Confections.

**566.—456\*. BIFFI, PAOLO,** *Milan.*  
Confections.**567.—457. BODINO, LUIGI,** *Genoa.*  
Chocolate.

**568.**—461\*. BRASINI, BROTHERS,  
*Forlì.*

Chocolate of various sorts.

**569.**—415. GIULIANI, VITTORIO,  
*Turin.*

Chocolate shavings.

**570.**—576. LUPINACCI, LUIGI, AND  
BROTHERS, *Cosenza.*

Gooseberry syrup.

**571.**—439. SALTARELLI, A., *Pisa.*

Candied fruits.

**572.**—442. SPANO, LUIGI, *Oristano*  
(*Cagliari*).

Confections of orange peel.

Chocolate with cinnamon.

Chocolate with vanilla.

Chocolate à la santé.

Chocolate à la génoise.

**573.**—492\*. SPEZI, DOMENICO, *Fo-  
ligno.*

Confections.

Chocolate.

**574.**—443. TORRICELLI, ANDREA,  
*Florence.*

Chocolate of various qualities.

**575.**—445. VALERI, ANTONIO,  
*Ferrara.*

Preserved peaches, known under  
the name of Persicata.

#### § 6. HONEY.

A rather important yield of honey is cultivated in the various Italian provinces; the honeys of the Valtellina, Lombardy, and Volterra, in Tuscany, with those of Sicily, have a considerable reputation.

The bitter honey is a peculiar kind, which is brought from Sardinia, of which the origin seems referable to the existence of heat, which in some localities are almost exclusively within reach of the bees. This honey is not poisonous.

**576.**—447\*. AMICARELLI, VIN-  
CENZIO, *Foggia.*

Virgin honey.

**577.**—113. GABRIELE, D. A., *San*  
*Bartolomeo in Galdo (Benevento).*

Hyble honey.

**578.**—420. LAVAGGI, GABRIELLO,  
*Catania.*

Hyble honey.

**579.**—423. MAJORANA, BRO-  
THERS, *Catania.*

Honey comb.

Honey.

**580.**—424. MALMUSI, CARLO,  
*Modena.*

Pickled honey.

**581.**—425. MARINI - DEMURO,  
TOMMASO, *Cagliari.*

Bitter honey comb.

**582.**—429. ORRU, SISINNIO, *Burcei*  
(*Cagliari*).

Bitter honey.

Common honey

## SECTION III.

## WINE, LIQUEURS, TOBACCO, &amp;c.

## WINE.

Wine, next to cereals, is the most important production of the Italian soil.

In a superficies of about 32,000,000 of hectares, containing forests, lakes, rivers, and roads the peninsula produces annually 28,340,000 hectolitres of wine, that is to say, every proportion duly kept, 10·34 per cent. more than France, which gives 45,000,000 hectolitres from a superficies of 53,000,000 hectares.

In estimating the average price of the hectolitre at 16s., wine represents in Italy a value of £22,640,000.

The fruit of the vine ripens in all parts of Italy, in the plains as well as on the hills and mountains, and even close to the limit of the chestnut trees.

The varieties of vines are almost innumerable. There are some adapted to certain localities, and of limited cultivation, and others which are almost invariably grown in every district. The greater part are indigenous, and of very ancient origin; others, having been originally transplanted from Italy, have been reintroduced with new properties from Hungary, the banks of the Rhine, the south of France and Spain, from the Cape of Good Hope, and the Canary Islands. There are some varieties from America of the Labruscan or Isabella (*Vitis Labrusca*), remaining in the gardens up to a recent period objects of curiosity, but their cultivation is rapidly increasing, because it has been observed that their grapes have not been affected by *Oidium*.

The methods followed in dressing and planting the vine are equally various. In the southern countries, and in the plains the vine is trained up high trees, such as elms, poplars, and walnut trees, and the branches which reach to the tops are interwoven amongst themselves, forming garlands and festoons. In other places props are used, arranged in such a manner as to support the shoots of the vine, which are lengthened or shortened in various ways. The vine is also cultivated on trellis work, in espalier, also separate and without props. This last system, which is rather unusual, is chiefly employed on the heights, and is the best method in the dry soils of the small islands.

In every part, unfortunately, but little attention is paid to the choice of the vines best fitted for cultivation. Various qualities of grapes are all promiscuously gathered in the same vintage, white, black, sweet, and sour, after a more or less perfect maturity, without much care being paid to the proportions to be observed amongst them during the process they undergo in the making. Sometimes, the most intelligent vine-growers separate the grapes, according to their qualities and their different degrees of ripeness, and thus obtain wines more esteemed, more equal in character, and capable of keeping longer. A small number plant separately the various qualities of vines, afterwards mixing the grapes and the must in the proportions which experience has indicated to them as being the best. This last method is much extending in Piedmont.

The process generally employed in making wine consists in treading the grapes in tubs (tini), which are left open in the wine cellars; and the liquor being drained off, as soon as the active fermentation has ceased, it is transferred to the tuns, where the action of the second fermentation takes place, in which the wine is clarified and completely made.

Nevertheless, the grapes are sometimes left in the open air during some time; they are then pressed, and the must is carried away and placed in barrels to ferment. This is the process followed, especially in the making of full-bodied wines, like the *Vin santo*.

The black wines are obtained by crushing the grapes, and leaving the husks and stems in contact with the must; there are white wines, less valued by drinkers, made either from white grapes, put into tubs separately from the black wines, or from the liquor, which ferments separately from the husks.

Machines for picking grapes or crushing them are not generally known, but everything is prepared by manual labour. Nevertheless, the common presses, that is, mechanical presses, are employed to obtain the wine from the residue, which is called *stretto*.

Some wine producers have constructed vats, others have cisterns, closed hermetically as soon as the fermentation has subsided, wherein the wine is kept for an indefinite period.

The wine being placed in the tubs and cellars, there undergoes its last vinous change in a natural way, which does not fail to superinduce sensible differences in the article, caused by the positions of the cellars themselves, their temperature, and other extrinsic circumstances, and by the variation of seasons.

But a mixing or doctoring (*governo*) of wines is also practiced, by adding at one or successive times to the wines in the tuns, either a quantity of concentrated must, produced by

boiling, which is called *collo*, or of grape juice thickened by exposure to the open air, and made from the sweetest and best coloured fruit; this gives a tint and flavour to the wine much appreciated by consumers, but which certainly does not improve the natural body of the wine itself. For this reason, although the wine growers succeed in raising the price of some wines, the expedients resorted to, as above described, ought to be condemned rather than approved. The practice of sulphuring wines is well known and resorted to; not equally so is clarification; but some wine growers attempt to improve their wines by clearing them as much as possible from all extraneous matters. The process of changing the liquor from one vessel to another in the month of March is adopted, from which a remarkable clearing of the wine results.

Considering the natural elements possessed by Italy, and the mode practised of making wine, of which we have just given a brief sketch, it is easy to comprehend what an enormous production of wine there is in ordinary times, and the augmentation of which it is susceptible.

It is easy to conceive the infinite variety of wines produced, and which depend upon natural circumstances, or upon the system adopted in preparing the wines, in which a uniformity in the early stages of the process being disregarded, the chances of a variation of the produce are greatly augmented. This will fully account for the variation in the produce of the wines of Italy, and leaves the field open for immense improvement.

It is useless, in the present day, to seek those wines which formerly gave such delight to *connoisseurs*, those wines of Falerno, of Opimiano, which, slowly maturing, and with their spirit preserved for a century, inspired the poets of antiquity. But we have still the wines of Asti, the Montepulciano, the Orvieto, the Lachryma Christi, the muscats of Syracuse, and other exquisite productions, which, with the Marsala, are appreciated wherever they are introduced. There are amongst the wines of Italy sufficient to satisfy whatever demands may spring up from abroad, and the present resources can be indefinitely augmented.

The Italian producers will not neglect to improve their system of making and keeping wines; and the prospects opened to them by foreign commerce will be embraced with a conviction of their competency to meet any demand, still reserving to the produce of different places, the original distinctions which attach to them from the circumstances which have made them famous.

The reasons previously given place us in a position to exhibit a considerable number of experiments, and the determination of various elements of the wines of Italy, which, having been made by M. Fausto Sestini and M. Attilio Fabrini, subsequently to the Italian Exhibition, upon specimens which leave no doubt of their genuineness and the completeness of the selection, have, on that account, an especial value. The Royal Commission of the Italian Exhibition of 1861, upon the requisition of M. A. Targioni Tozzetti, inspector and reporter of the 5th class of the above Exhibition, ordered these experiments to be made, and this duty has been performed, together with a number of others of the same sort, in the laboratory of the Agricultural Institution in Florence, by the young and able chemists who have been so favourably mentioned, under the supervision of M. Targioni himself, who has recently presided at the inauguration of that institution dedicated to agricultural experiments of all sorts. M. Cozzi and M. de Luca have given some analyses of the wines of Italy, which ought to be consulted concurrently with the above, however partial they may be.\* The sulphurous smell of the grape wine, which has been treated with brimstone on account of the vine disease, has stimulated other researches; which, being completed, together with those by M. Sestini, under the supervision of M. Targioni, have discovered that the sulphuretted hydrogen is a product of the decomposition of sugar, which, in presence of sulphur, and the act of fermentation, undergoes partially a lactic fermentation and gives out a quantity of hydrogen, which, being evolved under the above conditions, combines with the sulphur suspended in the must. Amongst all the processes employed to get rid of the smell of sulphuretted hydrogen, there is nothing better than exposure to the air, when changing the wine in the casks, or sulphuring the wines with the vapour of burnt sulphur.

\* The analyses of M. Cozzi, inserted in the proceedings of the Royal Academy of Georgofiles of Florence (1848), give for the maximum of alcohol 9.80, the minimum 5.83, the average being 7.81. Those of M. De Luca, inserted in the *Nuovo Cimento*, fourth year, with reference also to those of M. Cozzi on the wines of Tuscany, give

	Maximum.	Minimum.	Average.
Alcohol .....	14.0	4.0	9.00
Fixed organic matters.....	5.0	1.0	2.62
Inorganic matter .....	0.6	0.1	0.24

Alcohol is always fixed at 1,000, whilst in the analyses made by Brande of the wines of Marsala and Syracuse it is 0.825.

The acidity is estimated collectively, supposing that it proceeds from tartaric acid.

In order to arrange the wines in the Tables, the following order has been followed:—

- |                          |                     |
|--------------------------|---------------------|
| 1. Common wines.         | 4. Marsala.         |
| 2. Red particular wines. | 5. Imitation wines. |
| 3. Choice wines.         |                     |

ANALYSIS OF ITALIAN WINES.  
By M. Fausto Satini, of Florence, and M. Attilio Fabrizi, of Savignano.

DESCRIPTION.	WHENCE DERIVED.	QUALITY.	ALCOHOL. AT 15°.		Estimated value of acidity com- ing from the lactic acid.	Substances at 120°.	Ashes.	Water at 15°.	OBSERVATIONS.
			In volume.	In weight.					
1. COMMON WINES.									
Ordinary wine from For- nello Campi ...	1861 R. Vanni ...	Red, clear, dry .	8.6	6.88	1.218	1.800	0.091	91.320	Prepared from the grapes of the same property, and by the fermenta- tion of expressed must.
Do. ...	1860 ...	Red, white, dry, sourish.	9.8	7.84	1.436	1.617	0.155	90.543	
American grape wine ...	1848 C. Ridolfi ...	Red, dry, sourish.	8.2	6.56	1.740	1.736	0.136	91.704	
Noble wine from Monte- palciano ...	1860 Colombi ...	Dark red, dry. ...	10.2	8.16	0.957	1.692	0.200	90.148	
Do. ...	1860 Bracci ...	" "	10.2	8.16	1.560	1.473	0.164	90.367	
Natural wines from the neigh- bourhood of Salerno ...	G. Pacifico ...	" "	13.0	10.40	1.479	3.000	0.364	86.600	
Ordinary wine from Ter- lizzi (Bari) ...	1856 ...	Red, dry, alcoholic	14.2	11.36	1.740	2.018	0.273	86.622	
Bagnaja wine (Elbe) ...	G. Mangano ...	Reddish dry	11.3	9.04	1.477	6.373	0.173	84.587	
Riminese wine from the Isle of Pianosa ...	G. Doni ...	Reddish white, slightly astringent	13.5	10.80	1.131	2.323	0.200	86.877	
White wine do. ...	" "	Very dry white,	11.2	8.96	1.305	1.873	0.217	89.167	
White wine from the Isle of Giglio ...	St. Aldi and Co. ...	Reddish white, cloudy	15.0	12.00	1.305	1.756	0.289	86.167	
Monica wine from Quartu (Sardinia) ...	C. Bava ...	Reddish white dry	15.0	12.00	1.523	4.643	0.433	83.357	
Red do. from Costa Etna (Sicily)	Panelbianco, d'Ac- Reale.	Red, pale, dry	12.7	10.16	1.218	3.918	0.536	85.922	
2. PARTICULAR RED WINES.									
Brachetto wine from Asti	1859 F. Varvello ...	Red, pale, dry, slightly sweet...	13.8	11.04	"	3.206	0.221	85.754	These two wines disem- gaged some bubbles of carbonic acid.
Do. ...	1860 ...	Red, sourish, dry	11.8	9.44	"	2.346	0.235	88.214	
Nebiolo do. from Grinzano	1847 L. Ondart, Genoa ...	Red, pale, dry, sweet, with after taste a little bitter	13.0	10.41	"	2.114	0.175	87.475	
Wine of Neive ...	1858 ...	Red, dark, dry	12.4	9.92	"	2.011	0.211	88.069	
Dry wine from Asti	1855 N. Baracco, Turin ...	Red, pale, dry	12.3	9.84	1.827	1.400	0.140	88.760	
Asti wine ...	1860 F. Varvello ...	Red, pale, sourish, slightly effervescent	10.3	8.24	"	3.992	0.212	87.785	

DESCRIPTION.	WHENCE DERIVED.	QUALITY.	ALCOHOL AT 15°.		Estimated value of acidity combining from tartaric acid.	Substances dissolved at 130°.	Ashes.	Water at 130°.	OBSERVATIONS.
			In volume.	In weight.					
Effervescing wine from Asti 1860	F. Varvello	Red, effervescent, sweetish	8.4	6.72	1.392	8.373	0.191	86.907	
Dry do. from Asti, superior quality 1850	N. Baracco, Turin	White, fawn-coloured, sweet, alcoholic	11.8	9.44	1.968	2.160	0.140	88.400	
Grignolino wine from Asti	F. Varvello	Red, pale, dry, sourish	13.0	10.40	1.349	6.536	0.156	83.064	
Do. ...	N. Baracco, Turin	" sourish	10.9	8.72	2.584	3.156	0.170	88.124	
Aquatic wine	Cav. Bruni	" pale, scurish	11.8	9.44	1.349	2.456	0.142	87.544	
Red wine	M. Bovone, Genoa	" dry	10.2	8.96	1.566	2.796	0.130	88.244	
Grignolino, superior quality	F. Cora, Turin	" dry	12.5	10.00	2.132	2.456	0.142	87.544	
Do. from Asti	C. Bator, Turin	Yellow-shaded, dry, somewhat bitter	12.8	10.24	...	2.250	0.146	87.500	
Barbera from Asti	F. Iaullo, Asti	White - yellowish, cloudy, a little bitter	13.7	10.96	1.218	1.516	0.192	87.524	
Do. ...	V. Perusino	Red, dark, sourish	14.1	11.28	1.305	2.736	0.304	85.984	These wines have the taste of Marsala.
Do. ...	N. Baracco, Turin	" dry	11.8	9.44	1.218	2.718	0.146	87.847	
Do. ...	G. Ballor, Torino	" " "	13.0	10.40	1.636	2.087	0.140	87.513	This wine produces carbonic acid.
Do. from Bormida	R. Pagliano, Asti	" cloudy	12.5	10.00	1.827	3.324	0.282	86.576	
Do. from Clivolo	Merlo, Monferrato	" pale, dry	16.8	13.24	1.623	2.610	0.160	84.150	This wine was slightly adulterated.
Do. from Acqui	L. Oudard, Genoa	" dark, dry	10.6	8.48	1.305	1.780	0.210	89.760	
Do. from Bobbio	Chev. Bruni	" White, sweet, very slightly acid	11.5	9.20	1.349	3.236	0.188	87.564	
Sweetish wine from Grinzano 1849	Buelli	" Red, sweet, very slightly acid	12.9	10.32	1.392	1.863	0.205	87.817	
Do. from Acqui	L. Oudard, Genoa	" pale, dry	14.3	11.44	1.560	2.246	1.063	86.314	
Do. from Acqui	Chev. Bruni	" Red, pale, very slightly bitter	10.4	8.32	1.653	2.786	0.214	82.894	Cork badly kept down.
Lacrina rossa	M. Bovone, Genoa	" dry, astringent	13.7	10.96	1.218	1.644	0.164	87.396	
Pignolo di Neive	L. Oudard, Genoa	" White, dry, aromatic	12.7	9.96	1.392	1.890	0.141	88.150	
Barolo	L. Oudard, Turin	" Red, pale, very dry red	10.2	8.24	1.349	1.840	0.141	89.920	
Do. Asti	F. Barrelo, Asti	" Very dry red, slightly effervescing	11.8	9.44	1.392	2.813	0.250	87.747	
Cortese from Grinzano...	L. Oudard, Genoa	" Very dry red, slightly effervescing	12.6	10.08	1.305	1.479	0.165	88.441	
Bordelese trillustre from Broni...	N. N. of Voghera	" Very dry red, slightly effervescing	12.3	9.84	1.435	1.839	0.185	88.321	Taste of Vin Santo.
Lambrusco from Sorbara	Zannotti	" Red, slightly sparkling, sourish, sweetish	10.9	8.72	1.610	2.064	0.217	89.216	
Do. ...	"	" Red, slightly sparkling, sourish, sweetish	10.3	8.24	1.523	2.936	0.164	87.024	
Do. ...	"	" Red, slightly sparkling, sourish, sweetish	11.2	8.96	1.391	1.955	0.173	89.085	
Amabile from Modena	Gozzi of Modena	" Red, slightly sparkling, sourish, sweetish	10.4	8.32	1.566	3.655	0.200	88.025	

DESCRIPTION.	WHENCE DERIVED.	QUALITY.	ALCOHOL AT 15°.		Balance value of acidity coming from tartaric acid.	Substance at 130°.	Ashes.	Water at 15°.	OBSERVATIONS.
			In volume.	In weight.					
Amaro ... .. 1860	Gozzi of Modena...	Red, slightly sparkling, a little bitter ...	10.0	8.00	1.262	1.555	0.225	90.445	
Del Colombaro ... 1848	A. Agazzotti	Red, sourish ...	10.3	8.24	1.593	2.310	0.170	89.450	
Do. ... .. 1860	N. N. "	" dry ...	10.4	8.32	1.653	3.333	0.173	88.347	
Di Correggio ... 1848	A. Maestri	" sweetish ...	11.9	9.52	1.349	3.629	0.114	86.851	
Vin lambusco amaro na- turale from Fontana...	...	" sourish ...	9.7	8.78	1.523	1.725	0.136	91.515	
Do. from Vignola ... 1859	...	Dark red, astringent, sourish ...	9.5	7.60	1.566	1.864	0.255	90.536	
Montalcino wine ... 1860	C. Santi	" dry, aromatic ...	13.9	11.12	1.219	1.600	0.100	87.280	
Canapolo from S. Savino	E. Angelici	Red, aromatic, sourish ...	9.7	7.76	1.218	8.360	0.200	83.880	
1860	A. Ferrarini, Reggio	White, dry ...	15.3	12.24	1.523	2.386	0.118	85.874	
1857	"	" " a little bitter ...	15.0	12.00	1.566	2.682	0.136	86.318	
Cisolo from Montalbo ...	Piacenza	" " " ...	13.6	10.88	1.914	5.264	0.136	83.856	
Sangiovese from Modigliana	Count Campi	Red, dry ...	10.5	8.40	1.349	1.819	0.218	89.781	A disengagement of car- bonic acid had taken place.
1860	...	" pale, dry, bitter, a little cloudy	14.5	11.60	2.045	1.091	0.146	87.449	
Zuccavese from S. Cesario, } 1859	...	{ White, sourish, cloudy, a little bitter	12.3	9.84	1.392	1.282	0.282	88.878	
near Lecce ... .. 1859	Sgilliti, Principato } Citeriore...	{							
Greco from Nocera inferior ...	...	White, shaded, sourish ...	12.9	10.32	1.523	3.050	0.240	86.630	
Ausonia, from the Island of Giglio ... .. 1848	St. Aldi and Co. ...	" yellowish, dry, alcoholic	16.0	12.80	1.653	2.326	0.164	84.874	
Vernaccia from Oristano	P. Spano, Sardinia	" alcoholic ...	16.0	12.80	1.205	4.200	0.257	81.000	Badly kept.
Guarnaccio, from Syracuse	G. Mascuzza	Red, pale, dry ...	13.8	11.04	1.262	1.714	0.500	87.246	
White wine from the slopes of Etna ... ..	D. Cottanella d'Ac itale	White, dry, bitter ...	16.5	13.20	1.175	1.882	0.255	84.918	
Grape wine from Cato- ratta, near Celalù ... } 1860	Mandralisca								
3. VERY CHOICE WINES.									
(a) <i>Madrasie</i> .									
White Malvasia wine } 1847	V. Perugino	" fawn-coloured, sweet...	15.1	12.08	1.392	6.471	0.224	81.449	
from Asti ... .. 1859	"	Pale red, sweet, sourish through carbonic acid	12.9	10.32	1.305	2.535	0.353	87.145	

DESCRIPTION.	WHENCE DERIVED.	QUALITY.	ALCOHOL AT 15°.		Estimated value of acidity com- paring from the Tartaric acid.	Substances dissolved at 120°.	Ashes.	Water at 15°.	OBSERVATIONS.
			In volume.	In weight.					
Dry Malvasi of Grinzane	1847	L. Oudart	16.4	13.12	1.479	2.073	0.257	84.807	
Amabile	1848	"	15.1	12.08	1.131	2.098	0.275	85.822	
From Castelnuovo Bor-	1849	N. N. d'Acqui	12.6	10.08	1.348	10.006	0.241	79.914	
inda	1860	"	13.6	10.88	1.697	2.845	0.425	86.275	
Black from Lecce	1859	Bava di Cagliari	15.0	12.00	1.653	10.036	0.400	77.964	Wine probably obtained
From Gira, Sardinia	1856	G. Marini	18.6	14.88	1.610	2.573	0.109	82.547	from withered grapes.
Do.	"	Cav. Irunas	16.1	12.88	1.740	2.167	0.200	84.953	Marsala flavour.
From Rosa, 1st quality	"	"	14.2	11.36	1.131	3.945	0.082	84.695	
From Rosa, 3rd quality	"	"	14.2	11.36	1.131	3.945	0.082	84.695	
Malvasia	"	Pietro Marini, of	14.7	11.76	1.392	1.533	0.189	86.707	
From Syracuse	1859	Cagliari	16.8	12.64	1.305	15.937	0.400	71.423	
From Lipari	1860	F. Mioli, Leone	11.6	9.28	1.523	19.267	0.263	74.453	
Passerella	"	G. de Pasquale	"	"	"	"	"	"	
Do.	"	F. Cova, of Tunin	"	"	"	"	"	"	
Do.	1859	A. Maino d'Allessau	10.5	8.40	0.914	18.315	0.163	79.285	Vermouth flavour.
Do. sparkling	1860	F. Varvello d'Asti	12.2	9.76	1.218	13.320	0.280	76.920	
Agliano from Asti	1859	N. Baracco	6.4	5.12	1.392	9.809	0.200	85.071	
Bianco Natalino forzato	1847	F. Varvello d'Asti	11.5	9.20	1.633	12.986	0.150	77.814	
Procanico from Orvieto.	1858	F. Ravizzo	10.0	8.00	1.392	11.009	0.182	80.891	
			10.5	8.40	1.349	5.259	0.123	86.341	
(3) VIN SANTO.									
Vin santo from Ceruzia	1846	Bertolini, Perugia	16.0	12.80	1.436	9.318	0.136	77.882	Foul.
Do.	1860	T. Belli	10.4	8.32	1.740	16.564	0.217	75.116	
Do. of M. Gualando	"	Count R. Ranieri,	"	"	"	"	"	"	
Do.	"	Perugia	19.2	15.36	1.827	10.145	0.145	74.493	
Do. from Caluso	1857	F. Cucchi, Parma	14.4	11.52	1.479	5.325	0.164	83.155	
Do. from Carmignano	1847	F. Crenoncini	14.2	11.36	2.001	6.332	0.459	82.308	
Do.	1856	"	17.1	13.68	1.044	2.857	0.200	83.963	
Do. sweet	1857	"	15.2	12.16	2.001	5.660	0.270	82.280	
Do.	1860	"	15.0	12.00	1.827	3.545	0.364	84.455	Carbonic acid disengaged.

DESCRIPTION.	WHENCE DERIVED.	QUALITY.	ALCOHOL AT 15°.		Estimated value of acidity com- ing from the tartaric acid.	Substances dissolved at 150°.	Ashes.	Water at 15°.	OBSERVATIONS.
			In volume.	In weight.					
<i>(c) ALEATICI.</i>									
Modigliana wine ... 1852	Bedronici ...	White dry ...	15.7	12.56	1.305	2.682	0.191	84.758	Badly kept.
Do. ... 1859	"	" sweetish, aromatic ...	13.3	10.64	1.158	9.013	0.337	80.347	
Tizzana dry wine ... 1856	Gazzarini ...	" amber, slightly acetic ...	15.6	12.48	1.566	6.527	0.271	80.993	
Montepulciano wine ... 1856	C. Bracci ...	" alcoholic ...	14.3	11.44	1.740	14.750	0.200	73.810	
Valgiano wine ... 1859	Ciudotti, Lucca ...	" yellowish, sweet ...	13.0	10.40	1.523	8.982	0.255	80.618	
Dry wine from Montaleino 1858	Count Santi ...	" dry ...	14.1	12.28	1.302	1.546	0.182	87.174	
<i>(c) ALEATICI.</i>									
Aleatico di Doggia ...	A. Ginori, Lisci ...	Red, sweet, agreeable, perfumed	14.2	13.36	2.188	8.582	0.382	80.158	These wines had formed a red deposit.
Do. S. Felice in Chianti ...	D. S. Grisaldi ...	" sweetish ...	12.1	9.68	1.255	5.473	0.155	84.847	
Aleatico, from the neighbour- hood of Pistoja ... 1842	D. Carlo Tolomei ...	" pale, fine bouquet ...	11.1	8.88	1.218	8.455	0.173	82.665	
Aleatico of Carmignano ... 1844	J. Cremoncini ...	White, sourish ...	12.8	10.24	1.575	1.482	0.182	88.278	
Do. ... 1850	"	" reddish, alcoholic ...	15.6	12.48	1.479	4.036	0.236	83.484	
Do. ... 1858	"	" sweet ...	9.9	7.92	1.827	8.640	0.240	83.440	
Do. of Montaleino ... 1860	C. Santi ...	Red, dark, sweet, fine bouquet	14.6	11.68	1.653	8.509	0.164	79.811	
Do. of St. Pietro, in } Marcigliano ... 1849	C. Mazzorosa, Lucca	" aromatic, agreeable ...	12.8	10.24	1.044	3.483	0.250	86.277	
Do. of Modigliano ... 1860	C. Campa ...	" unpleasant ...	15.1	12.08	1.131	2.255	0.127	85.665	Carbonic acid disengaged.
Do. de Terlizzi, (terra di Bari) ... 1850	Guest unacchio ...	Sweetish, little scented ...	12.7	10.16	1.262	3.609	0.217	85.231	
		Reddish white, sweet ...	13.2	10.56	1.044	7.667	0.388	81.773	
<i>(d) MUSCATS.</i>									
<i>Muscats, properly so called.</i>									
Muscato from Asti ...	G. Pagliano ...	Sparkling white, sourish, aromatic	5.1	4.08	1.131	11.930	0.173	83.990	It tasted of yeast. [this wine, something nauseous in
Do. white from Asti... 1860	G. Varvello ...	" sweetened	6.6	5.28	1.044	6.284	0.146	88.436	
Do. from Lecce ... 1860	N. N. ...	Sourish, white, sweet, clouded	19.4	15.52	2.306	8.846	0.426	76.134	
Do. from Aquila ... 1859	G. de Marinis ...	White, ambered, liqueurish, aromatic ...	13.5	10.80	1.566	9.616	0.167	79.584	

DESCRIPTION.	WHENCE DERIVED.	QUALITY.	ALCOHOL AT 15°.		Estimated value of acidity com- ing from the Tartaric acid.	Substances dissolved at 15°.	Ashes.	Water at 15°.	OBSERVATIONS.
			In volume.	In weight.					
Muscat segestano ... 1859	...	White, very sweet	9.0	7.21	1.871	21.720	0.420	71.080	
Do. black from Lipari ... 1859	G. de Pasquale ...	Deep red	12.5	10.00	1.566	14.000	0.387	76.000	
Do. from Solanto ...	...	Reddish white	11.6	9.28	0.870	12.167	0.167	78.553	
Do. di Dama ...	Cav. S. Costa (Si- cilia) ...	Tawny white, liqueurish	16.2	12.96	1.044	17.130	0.270	69.890	
Do. Presidente ...	Ant. Pamplonia, ...	...	...	...	...	...	...	...	
Do. Carmignano ... 1859	Palermo ...	Dark red, liqueurish, thick	16.5	13.20	1.914	19.418	0.450	67.382	
Do. Montalcino ... 1854	T. Cremoncini ...	Sweet, white, spirituous	16.5	13.20	1.479	8.997	0.245	87.803	
Do. sparkling Montalcino ...	T. Angerelli ...	Sweetish white, sourish, slightly sparkling ...	11.6	9.28	1.740	9.673	0.164	81.047	
Do. from M. S. Savino ... 1859	C. Santi ...	Sparkling white	6.5	5.20	1.305	1.315	0.082	93.485	
	Ferd. Fical ...	Amber yellow, sweetish	10.0	8.00	1.175	5.000	0.227	87.000	Carbonic acid disengaged.
(c) WINES ALLIED TO MUSCATS.									
Granatino di contrada Palma ...	V. Gioeni, Catania	Tawney white, a little dry	20.0	16.00	1.914	3.273	0.209	80.727	
Do. ...	Vico Patrico (Si- cilia) ...	sweet, liqueurish	18.0	14.40	0.957	15.720	0.520	69.880	
Amarena ... 1854	V. Patané, Catania	" sweet	15.3	12.24	0.957	14.355	0.200	73.405	
Do. dry ...	Ant. Pamplonia, ...	...	...	...	...	...	...	...	
Do. ...	Palermo ...	alcoholic, bitter	23.4	18.72	1.392	4.082	0.391	77.198	
Do. white, from Agosta ...	Salv. A. Ruiz ...	dry, bitter	15.7	12.46	1.391	3.322	0.267	84.218	
Do. black ...	"	sweet, aromatic	14.4	11.52	1.001	14.457	0.514	74.023	
Amarena, segestano ...	"	Dark red, syrupy	4.7	3.76	1.914	39.257	0.286	56.983	
Do. (qualità unica) ...	Salv. A. Ruiz ...	Dark red	12.8	10.24	1.653	3.667	0.717	86.093	
Do. from Cefalù ... 1859	Cav. S. Costa (Si- cily) ...	" syrupy, aromatic	13.3	10.64	1.784	23.816	0.683	78.443	
Do. from Solanto ...	B. Mandralica ...	" aromatic	11.5	9.20	1.610	7.771	0.114	66.984	
Old Calabrese from Etna ...	M. del Toscano	"	15.2	12.16	1.392	3.322	0.267	80.069	
Calabrese from Catania ...	Catania ...	Red, yellowish, aromatic	18.2	14.56	1.479	2.820	0.427	82.615	
Do. from Syracuse ... 1858	V. Gioeni ...	Reddish white, liqueurish	15.6	12.48	1.218	8.382	0.155	79.138	
	G. Caracci ...	Tawny white, liqueurish	12.8	10.24	1.392	16.767	0.230	72.993	

DESCRIPTION.	WHENCE DERIVED.	QUALITY.	ALCOHOL AT 15°.		Estimated value of acidity from lactic acid.	Substances dissolved at 120°.	Ashes.	Water at 15°.	OBSERVATIONS.
			In volume.	In weight.					
4. MARSALA.	Calabrese from Solanto	...	14.9	11.92	1.218	6.244	0.189	81.836	
	Albanello from Syracuse	...	14.8	11.84	2.175	13.927	0.891	74.233	
	Do. ...	...	16.0	12.80	1.740	2.983	0.400	84.217	
	Occhio di Pernice	...	8.4	6.92	1.332	32.764	0.317	60.316	
	Do. ...	...	14.3	11.44	1.218	8.614	0.271	79.946	
	Do. ...	...	12.6	10.08	1.981	18.673	0.373	71.347	
	Do. ...	...	14.3	11.44	1.131	12.386	0.427	75.174	
5. IMITATION WINES.	Do. ...	...	15.0	12.00	1.479	17.900	0.369	70.100	
	Do. ...	...	15.3	12.24	1.392	3.625	0.500	84.135	
6. MARSALA.	Marsala, Italian quality	...	15.1	12.08	1.218	3.845	0.354	84.075	
	Marsala, superior	...	18.3	14.64	1.044	3.500	0.400	81.860	
	Marsala, English taste	...	19.5	15.60	1.218	3.600	0.389	80.800	
	Do. Italian taste	...	...	...	...	...	...	...	
	Do. ...	...	...	...	...	...	...	...	
	Do. ...	...	...	...	...	...	...	...	
	Do. ...	...	...	...	...	...	...	...	
	Do. ...	...	...	...	...	...	...	...	
	Do. ...	...	...	...	...	...	...	...	
	Do. ...	...	...	...	...	...	...	...	
7. IMITATION WINES.	Tokai from Asti	...	11.6	9.28	1.218	2.488	0.196	87.524	
	Do. ...	...	12.5	10.00	1.044	2.820	0.295	88.232	
	Do. from Carmignano	...	10.0	8.00	1.740	14.912	0.218	87.188	
	Do. ...	...	12.7	10.16	1.742	8.473	0.332	81.367	
	Etna Madeira	...	16.3	12.84	1.175	2.864	0.445	84.296	
	Erice Madeira	...	20.9	16.72	1.827	5.136	0.609	78.141	
	Segestano Madeira	...	20.2	16.16	1.740	5.943	0.414	78.797	
	Málaga, qualità unica	...	14.7	11.76	1.044	7.209	0.255	81.031	
	Wine to imitate Champagne	...	...	...	...	...	...	...	
	Do. ...	...	11.4	9.12	1.560	9.783	0.389	81.147	
8. IMITATION WINES.	Do. ...	...	13.0	10.40	1.131	1.044	0.200	88.556	
	Sparkling from Castelnuovo	...	10.2	8.60	1.566	6.964	0.182	84.976	
	Do. Marchiano from Loreto	...	8.6	6.80	1.131	17.446	0.117	75.754	
	Do. ...	...	...	...	...	...	...	...	

## LOMBARDY.

**583.—509.\* ANSELMI - BER-CANOVICH, MARIA, Verona.**

Wine from grapes (sulphured) from the hill S. Colombano.

The use of sulphur for protecting grapes is now common in Italy.

**584.—530. BRESCIA (SUB-COMMITTEE OF)**

Wines of different qualities.

**585.—673.\* BUELLI, E., Bobbio (Pavia).**

Eight qualities of white wine, from the grapes of Alicant, Champagne, Gerbidi, Frontignac, Madeira, Malaga, Marsala, and Tokay, cultivated at Bobbio.

Price 1s. 2d. to 2s. 6d. the litre.

Ten qualities of red wines, made from the vineyards of the Rhine, Alicant, Bordeaux, Burgundy, Catalonia, Isabella, Sardinia, Mamola, Gerbidi, and Aleatico, cultivated at Bobbio.

Price 1s. 2d. to 1s. 4d. the litre.

**586.—534. CAIMI, FILIPPO, Sondrio.**

Collection of wines.

**587.—2141.\* GUARNASCHELLI, GIOVANNI, Broni (Pavia).**

Red wine, dry and sweet.  
Trilustrum Vin Santo.

The *Vino Santo* is a sort of muscat liqueur, dry or sweet, and is prepared from white grapes, which are carefully selected and dried in the air.

White muscat wine.

Dry white wine.

Trilustrum Bordeaux wine.

Aleatico and Tokay wine.

The wine of Aleatico takes its name from a vineyard producing black grapes, very sweet and of great fragrance.

Vinegar from pure wine.

**588.—661. VITTONI, FELICE, Milan.**

Sparkling Nebiolo wine.

Bitter Barbera wine.

Sparkling Passeretta wine.

Bitter Barolo wine.

Muscat wine.

Brachetto wine.

Vermuth wine.

Vermuth is a wine frequently used as a liqueur, and is prepared from white wine, which is very strong and seasoned with spices during its fermentation.

## PIEDMONT.

**589.—512. ALLEMANO, BROTHERS, Asti (Alessandria).**

Nebiolo wine of 1859.

Tokay do. 1859.

Barbera do. 1855, sweet.

Do. do. 1854, bitter.

Grignolino do. 1854.

White Muscat 1859.

These wines take their names from the vineyards.

**590.—517. BARACCO, NICCOLÒ, Turin.**

Dry Nebiolo wine.

New wine from Percetto.

Barolo wine.

Grignolino wine.

Vermuth.

**591.—539. BENDINELLI CASTIGLIONE, Novi.**

Common red wine; £2 5s. the hectolitre.

The annual produce is 400 hectolitres.

Choice wine of 1861; 1s. 8d. the bottle.

**592.—525. BORATTO, DOMENICO, Alessandria.**

Vermuth.

Production and commerce, 200 hectolitres.

Price 1s. 3d. the litre. Sent to foreign parts, in America, or Egypt.

Vinegar from red wine.

Do. white wine.

**593.**—526. BORLASCA, C., *Gavi (Alessandria)*.

Common red wine of 1862; £2 8s. the hectolitre.

Annual production 250 hectolitres.

Black wine of 1858, with grapes thickened in the air.

Annual production 1,000 bottles.

**594.**—527. BOTTI, ALESSANDRO, *Chiavari (Genoa)*.

Wines.

**595.**—529. BRAGGIO, COUNT FRANCESCO, *Strevi (Alessandria)*.

Common red wine, of Dolcetto, or Neretto grapes; 5d. the litre.

Grape wine thickened in the air; 5d. the litre.

Barbera bitter wine; 6d. the litre.

Sweet and bitter muscat; 10d. the litre.

Simple and natural wines of 1861.

All these wines are derived from vines cultivated on props slightly elevated. The most delicate qualities are obtained with the thickened grape, kept till October. For the muscats the must is separated from the solid parts. These wines are sent into the neighbouring provinces and into Switzerland.

**596.**—536. CARAMORA, PACIFICO, *Asti (Alessandria)*.

Red wine.

**597.**—544. COBIANCHI, LORENZO, AND ARDIZZOLI, GIUSEPPE, *Boca (Novara)*.

White and black wine, sweet and dry.

**598.**—674 *bis*. CANTALAMESSA, ASCANTO, *Turin*.

Wine.

**599.**—554. DEL PRINO, MICHELE, *Vesime (Alessandria)*.

White and black wine, from Acqui.

**600.**—554 *bis*. DEL PRINO, PASQUALE, *Vesime (Alessandria)*.

Wine of 1860.

**601.**—555. DEMICHELI, GIOVANNI BATTISTA, *Novi (Alessandria)*.

Black wine, called Neretto, of 1856 and 1860.

Annual product of 2 to 6,000 bottles.

**602.**—557. DENEGRI, GIOVANNI BATTISTA, *Novi (Alessandria)*.

Black wine, common, of 1861; £1 12s. per hectolitre.

Fine wine, of 1861, of selected and thickened grapes in the air.

Annual product, 2,000 bottles.

**603.**—558 *bis*. DESTICELLI, G., *Liguria*.

Neretto wine.

**604.**—2,137. FAVA AND RUBBIANO, *Casale (Monferrato)*.

Grignolino wine.

Goccia d'Oro wine.

Muscat wine.

Common wine.

**605.**—700\*. FLORIO, BROTHERS, *Asti (Alessandria)*.

Barbera wine.

Nebiole wine.

Brachetto wine.

Vermuth wine.

**606.**—567. GENTA, PAOLO, *Caluso (Turin)*.

White wine of 1860.

Red wine of 1860.

**607.**—706\*. GIOVINE, GIOVANNI BATTISTA, *Canelli (Alessandria)*.

White wine, of Passeretta and Malvasia grapes.

**608.**—583. MASSA, CARLO, *Casale (Alessandria)*.

Wines of various qualities.

- 609.**—588. MERLO, GIOVAN BATTISTA, *Castelnuovo, Bormida (Alessandria)*.  
 Lambruschetto wine.  
 Barbera wine.  
 Muscat wine.  
 Common wine.
- 610.**—2198. TARELLO, M., *Viverone (Novara)*.  
 Wine.
- 611.**—594. MONCALVO, DOMENICO, *Bisio, near Novi (Alessandria)*.  
 Common black Nebiolo wine of 1861, produced in the neighbourhood of Gavi, near Novi.
- 612.**—595. MONTEMERLO, E., *Novi (Alessandria)*.  
 Common red wine of 1861, at 4s. 2d. the hectolitre.
- 613.**—604. OREGGIA, G., *Savona (Genoa)*.  
 Wines.
- 614.**—609. OUDART, L., *Genoa*.  
 Dry Malvasia wine from Grinzano, of 1847.  
 Dry white wine from Neive, of 1847.  
 Cortese wine from Grinzano, of 1847.  
 Nebiolo white wine from Grinzano, of 1847.  
 Nebiolo wine from Neive, of 1858.  
 Sweet Nebiolo wine of 1849.  
 Dry Nebiolo wine from Polenza, of 1844.  
 Nevano wine from Gruizano, of 1848.  
 Sparkling Pignolo wine from Neive, of 1859.
- 615.**—607. OVADA (MUNICIPALITY OF) *Alessandria*.  
 Red wine of different qualities of 1861.
- 616.**—2169.\* PAGLIANO, FRANCESCO, *Asti (Alessandria)*.  
 Various wines: Barbera, Nebiolo, Muscat (white) of 1859 at 1s. 8d. the bottle.  
*id.* Barbera, Brachetto, Grignolino, white Muscat and Passaretta of 1861, at 10d. the bottle.  
 Vinegar of 1860, at 10d. the bottle.
- 617.**—619. PERUSINO, VINCENZO, *San Damiano d'Asti (Alessandria)*.  
 Red and white wines, superior and common.  
 White and red vinegar made from pure wine.
- 618.**—620. PICCHIO, PAOLO, *Vesime (Alessandria)*.  
 Common red wine from Anereto, £1 12s. the hectolitre.  
 Anereto wine of 1849, made from grapes thickened in the air, at 1s. 8d. the bottle.
- 619.**—622 *bis.* PONZIO, GIUSEPPE, *Vesime (Alessandria)*.  
 Muscat wine.  
 Best sweet Muscat wine.  
 Common sweet Muscat wine.
- 620.**—624 *bis.* PRANDI, LORENZO, *Vesime (Alessandria)*.  
 Sweet wine.
- 621.**—631. RICCI, GIOVAN BATTISTA, *Asti (Alessandria)*.  
 Brachetto wine.  
 Malvasia wine.  
 Tokay wine.  
 Grignolino wine.  
 White sparkling wine.  
 Barbera wine.  
 Barolo wine.  
 Sparkling Nebiolo wine.  
 Muscat wine.  
 Aleatico wine.

**622.—632. RICCI, LUIGI, Asti (Alessandria).**

Black wine at £2 the hectolitre.

**623.—(Wanting.)****624.—2134. SCALITE, NATALE, Vesime (Alessandria).**

Common wine.

Muscat and Malvasia wine.

Common sweet wine.

Muscat sweet wine, not common.

**625.—643. SCAZZOLA, GIOVANDIONISIO, Cascine (Alessandria).**

Common wine of 1861, at £1 16s. the hectolitre.

Muscat wine of 1837, at 3s. 4d. the bottle.

Strong Muscat wine of 1846, at 2s. 6d. the bottle.

Strong Muscat wine of 1855, at 2s. 6d. the bottle.

The annual production of the hills of Cascine amounts to 2,000 hectolitres.

**626.—655. ULRICH, DOMENICO, Turin.**

Vermuth and spices for manufacture of vermouth.

**627.—656. VALLINO, BROTHERS, Bra (Turin).**

Common dinner wines.

Costly wines made from Nebiolo grapes.

Vin Santo.

**628.—657. VARVELLO, FRANCESCO, Asti (Alessandria).**

Various wines, namely :—

	Per bottle.
Barbera wine of 1830	. 2s. 6d.
Do. 1861	. 2s. 6d.
Barolo wine of 1857	. 1s. 3d.
Do. 1861	. 1s. 3d.
White wine of 1846	
Do. 1847	
Do. 1850	

Sparkling white wine.

Brachetto wine of 1820.

Do. 1855.

Grignolino wine of 1855.

Malvasia do. 1840.

Do. do. 1846.

Do. do. 1855.

Sparkling Malvasia.

White Muscat.

Nebiolo wine of 1855

Sparkling Passeretta wine.

Sparkling wine of 1846.

Red wine of 1847.

**EMILIA.****629.—507\*. AGAZZOTTI, FRANCESCO, Modena.**

Lambrusco wine of 1860.

**630.—513. ALMERICI, MARQUIS GIOVANNI, Cesena.**

Wine from the vineyards of Franzano, at 10d. the litre.

**631.—519 bis. BELLUCCI, GIOVANNI BATTISTA, Modena.**

Lambrusco wine, 1858.

Tokay wine, 1857.

Aleatico wine, 1854.

Muscat wine, 1852.

**632.—668\*. BERGAMI, PIETRO, Ferrara.**

Common red wine of 1861.

**633.—523. BONNET, GIOVACCHINO, Comacchio (Ferrara).**

Common wine.

**634.—537. CASAZZA, ANDREA, Ferrara.**

Common red wine from San Martino.

Common red wine from Aguscello.

Red wine (Lambrusco) from Santo Egidio.

- 635.**—538. CASTAGNINO, IGNAZIO, *Imola (Bologna)*.  
 Vin Santo from the hills of Imola, of 1859.  
 Wine from the grapes of Querciola, Albona, Bianchino, and Malvasia, at 1s. 2d. the bottle.
- 636.**—547. CODIGORO (MUNICIPALITY OF) *Ferrara*.  
 Common red wine.  
 Red wine.  
 Monica wine.  
 Girò wine.  
 Malvasia wine.  
 Common black wine.
- 637.**—550. CUCCHI, TOMMASO, *Parma*.  
 Sparkling wine.
- 638.**—560. FANTINI, GIROLAMO, *Comacchio (Ferrara)*.  
 Best common wine.
- 639.**—695.\* FERRARA, (R. CHAMBER OF COMMERCE OF).  
 Common wine.
- 640.**—562. FERRARINÌ, ATTILIO, *Reggio (Emilia)*.  
 White wine from the farm of Dinazzano, near Reggio, at 2s. the bottle.  
 Muscat wine from the same place, at 1s. 7d. the bottle.
- 641.**—701.\* FORLÌ (SUB-COMMITTEE OF)  
 Common wines.
- 642.**—568. GINNASI, Count DIONISIO, *Bologna*.  
 Vin Santo of 1838, from the grapes of Bianchino, Querciola, and Forcellino, at 3s. 10d. the bottle.
- 643.**—570 *lis.* GUARINI, Count PIETRO, *Forlì*.  
 Wines from Bertinoro and Promo.
- 644.**—571. JACINI, BARTOLOMEO, *Modena*.  
 Sample of wine made without grapes on a peculiar system.
- 645.**—2143.\* LADERCHI, ACHILLE, *Faenza*.  
 White white.
- 646.**—2150.\* MANGINI, FRANCESCO, *Modena*.  
 Lambrusco wine of 1853.  
 Lambrusco wine of 1850.  
 Light red wine of 1854.  
 Dry Lambrusco wine of 1837.  
 Dry Lambrusco wine of 1847.
- 647.**—2158.\* MERLONI, BROTHERS, *Bertinoro*.  
 Wines.
- 648.**—593. MODENA (SUB-COMMITTEE OF)  
 Various wines.  
 Liqueurs peculiar to the province.  
 Vinegar.
- 649.**—612. PARMA (SUB-COMMITTEE OF).  
 Wines and liqueurs.
- 650.**—613. PASOLINI, GIUSEPPE, *Imola (Bologna)*.  
 Vin Santo, made from the grapes of Bianchino and Albana.
- 651.**—615. PAVANELLI, GIUSEPPE, *Ferrara*.  
 Choice red wine from the farm of Migliarino.  
 Choice red wine from the farm of Codegoro.

**652.—622. PIACENZA (SUB-COMMITTEE OF).**

Wines from the province of Piacenza.

**653.—593. RANONI D'ESTE, BONIFAZIO, Modena.**

Lambrusco wine of 1860.

**654.—2178.\* RAVENNA (SUB-COMMITTEE OF).**

Wines.

**655.—593. RIGHETTI, Modena.**

Lambrusco wines of 1851.

Do.	do.	1856.
Do.	do.	1860.

**656.—628.—REGGIO, EMILIA (SUB-COMMITTEE).**

White wine from Dinazzano.

White and black wine from Scandino.

White wine from Codemonte.

Black wine from Ghiardo.

Black wine from Fiano.

Wine from the plains of Correggio.

Black wine from Cogruno.

**657.—2180.\* SALIMBENI, LEONARDO, Modena.**

Two different qualities of Lambrusco wine.

**658.—2176. SANTUCCI, PIETRO, Ravenna.**

Canino wine.

Trebbiano wine.

Golden grape wine.

**659.—2189.\* SAVORELLI, MARQUIS, A., Forlì.**

Wines.

**660.—652. TORRI, LUIGI, Bondeno (Ferrara).**

Red wine made with golden grape.

**661.—628. TURRI, N., Reggio (Emilia).**

White wine.

Dry wine from Dinazzano.

**662.—628. VECCHI, CARLO, Reggio (Emilia).**

Sweet white wine of 1842.

**663.—2202.\* ZERBINI, PIETRO, Modena.**

Lambrusco wine from the plain.

## TUSCANY.

**664.—514. ANGHIRELLI, GIUSEPPE, Montalcino (Sienna).**

Dry white wine.

Common dry white wine.

Sparkling white Muscat wine.

**665.—521. BERNARDI, FRANCESCO, Sienna.**

Red wine from Chianti of 1858;  
1s. 2d. the bottle.

**666.—542. CHERICI, NICCOLÒ, Borgo San Sepolcro (Arezzo).**

Dry red wine.

Dry white wine.

Wine from Paglia.

**667.—548. COJARI, VINCENZO, Massa Carrara.**

Common black wine.

White wine.

**668.—549. CONTI, BASILIO (Agent of Mr. Riccardi), Pontedera (Pisa).**

White wine.

Vin Santo.

Aleatico wine.

Muscat wine.

Vermuth wine.

Champagne wine.

**669.**—553. DE GORI, Count AUGUSTO, *Sienna*.

Red wine from Val di Chiana (Arezzo).

White wine from do.

**670.**—563 *bis*. FORNATELLA, FARM OF, *Arezzo*.

Vin Santo of 1857.

Vermuth wine of 1860.

Common red wine.

**671.**—569. GRISALDI DEL TAJA, CARLO, *Sienna*.

Wine from San Felice, in Chianti.

**672.**—2142\* GUIDI, CAMMILLO, *Volterra*.

Wine from Pomarance.

Do. Val di Luino.

Do. San Cipriano.

**673.**—571 *bis*. IVALDI, DOMENICO.

Superior sweet wine.

Common sweet wine.

**674.**—2164\*. MANNELLI GALILEI, LUIGI, *Pontedera (Pisa)*.

Aleatico wine.

Vin Santo.

Muscat wine.

White wine.

Common wine.

Vermuth.

**675.**—2155\*. MASETTI, Count PIETRO, *Florence*.

Claret wine.

Occhio di pernice wine.

Red Muscat wine.

White Muscat wine.

Common wine.

Sparkling Vermuth.

Vinegar of different qualities.

**676.**—585. MAZZAROSA, Marquis LUIGI, *Lucca*.

Different descriptions of wines, from Saint Pierre, at Marcigliana.

**677.**—590. MILIANI, FRANCESCO, *Peccioli (Pisa)*.

Common black wine.

White wine.

**678.**—597. MONTINI, PASQUALE, *Fabriano (Ancona)*.

Artificial sparkling wine.

Aerated lemon water.

Aerated orange water.

Aerated aniseed water.

Aerated kirsch-wasser.

Imitation of Curaço.

Anisette, as at Bordeaux.

**679.**—599. MARIANI, NAPOLEONE, *Florence*.

Red wine, called Moriano.

White wine, called Ambra di Nozzole.

Vin Santo, of Nozzole; 2s. the litre.

Nozzole wine, at 1s. 8d. the litre.

Red Moriano wine, at 1s. the litre.

**680.**—2175\*. PICCARDI, GIUSEPPE, *San Casciano (Florence)*.

Vin Santo of 1857.

Do. 1858.

**681.**—PRATTO (FARM OF), *Valdichiana (Arezzo)*.

Common wine.

**682.**—629. RICASOLI, Baron BERTINO, *Florence*.

Different qualities of wine from Brolio-Chianti, in the province of Sienna.

Vermuth from Brolio.

**683.—630. RICCARDI-STROZZI,**  
CARLO, *Florence.*

Common wine from Chianti.  
Vin Santo from Querceto.

**684.—633. RIDOLFI,** Marquis  
COSIMO, *Florence.*

Wine from American grapes.

This wine is obtained from grapes of various kinds of the Labruscan vine. It is prepared in large quantities, and might be largely exported with profit. The Committee of the Jury of the 5th class of the Italian Exhibition has granted a medal in consideration of the bouquet of this wine, which not being adulterated by the addition of too much water, makes it wine very fit for domestic purposes.

**685.—634 bis. ROSPIGLIOSI-**  
PALLAVICINI, Prince, *Pistoja.*

Various kinds of wines.

**686.—2181.\* SALVAGNOLI-**  
MARCHETTI, ANTONIO, *Florence.*

White wine.  
Red wine.  
Moscadel wine.  
Aleatico wine.

**687.—639. SANTI,** CLEMENTE,  
*Montalcino (Sienna).*

Sparkling Muscat wine.  
Vin Santo.  
Grape wine from Brunello, discoloured.  
Pure old red wine.  
Wiesner.  
Persicino.

**688.—643 bis. SCROFIANO** (FARM  
OF), *Valdichiano (Arezzo).*

Malvasia wine of 1859.  
Common red wine of 1860 and 1861.

**689.—2199\*. TESI,** LEOPOLDO, *Pistoja.*

Choice white wine.  
Choice red wine.  
Choice common wine.

Vermuth.  
Vinegar from wine.  
Vinegar from fruits.

## UMBRIA.

**690.—683\*. COPPOLI,** Marquis  
RANIERI, *Perugia.*

New red wine.  
White San Leno wine.

**691.—616. PENNACCHI,** FRANCESCO, *Orvieto (Perugia).*

Wine from Pelia.

**692.—619 bis. PESARO** (AGRICULTURAL  
ACADEMY OF)

Aleatico wine.  
Vernaccia wine.  
White wine.  
Merzabile wine.  
Greek wine.  
Sangiovese wine.  
Catto wine.  
Albanian wine.

**693.—623. POTENZIANI** (HEIRS  
OF), *Rieti (Perugia).*

Tarano wine, from Rieti.

**694.—627. RAVIZZA,** GIULI AND  
BROTHERS, *Orvieto (Perugia).*

Procanico wine from Orvieto.

**695.—659. VINCENTINI,** PIETRO  
EDOARDO, *Rieti (Perugia).*

Wine like Champagne.

## SOUTHERN PROVINCES.

**696.—510. ALBINO,** PASQUALE,  
*Campobasso (Molise).*

Common wine from Castropignano.

**697.—663\*. ARRANGA,** GIOVANNI  
ANGELO, *Serracapriola (Foggia).*

Red wine.  
White wine.

**698.**—518. BARTOLINI, CARLO,  
*Cosenza.*

Collection of wines from Cosenza.

**699.**—520. BELTRANI, GIUSEPPE,  
*Trani (Bari).*

Common dark wine, 3d. the litre.

Common white wine, 4d. the litre.

**700.**—521 *bis.* BETTI, LODOVICO,  
*Aquila.*

Wine.

**701.**—671. BOCCARDO, BROTHERS,  
*Candela (Capitanata).*

Vin Santo.

Common wine.

**702.**—524. BONOLIS, FRANCESCO,  
*Teramo.*

Sparkling wine.

**703.**—CANOSA (MUNICIPALITY OF.)

Red wine.

White wine.

**704.**—676.\* CASALTRINITA  
(MAYOR OF), *Foggia.*

Wines.

**705.**—677.\* CASERTA (SUB-COM-  
MITTEE OF)

Lachryma wine from Pietrovairano.

Greek vernotico wine from Cancelllo.

Asprino wine from Briano.

**706.**—678.\* CASSANO, FRAN-  
CESCO, *Gioja (Bari).*

Early wines.

Common wines.

**707.**—541. CERRONE, GIUSEPPE,  
*Teramo.*

Sparkling wine.

**708.**—680.\* CESENA, CAMMILLO,  
*Bari.*

Red wines, 1st quality of 1860 ;  
3s. 7d. the litre.

**709.**—681.\* CIANI, GIOVANNI,  
*Bisuglia (Bari).*

Zagarese wine of 1861 ; 1s. 2d. the  
litre.

Muscat wine of 1861 ; 1s. the litre.

Common wine of 1861 ; 2d. the  
litre.

**710.**—546. COCOZZA, CARLO,  
*Benevento.*

Wine from Panavaro (Benevento).

Aglianico wine ; 5d. the litre.

**711.**—682.\* COLLENZA, EMMA-  
NUELE, *Valenzano (Bari).*

Malvasia of 1861, at 11d. the litre.

**712.**—COLETTA, ANTONIO, *Piat-  
toli.*

Wine.

**713.**—686.\* D'AMBROGIO, LUIGI,  
*Deliceto (Foggia).*

Wine.

**714.**—687.\* D'AMBROSIO, VIN-  
CENZO, *Sansevero (Foggia).*

Wines of 1848 and 1850.

**715.**—551. D'ANTONIO, SALVA-  
TORE, *Ornano (Abruzzo Ul-  
teriore I.).*

Various sorts of wines.

**716.**—552. DE ANGELIS, MICHELE,  
*Isola (Abruzzo Ulteriore I.).*

Old wines.

- 717.**—690.\* DELLA BELLA, DIONISIO, *Vico (Capitanata)*.  
Muscat wine.
- 718.**—688.\* DELL'ERMA, NICCOLÒ, *Castellana (Bari)*.  
White wine of 1861, at 3d. the litre.
- 719.**—689.\* DELL'ERMA, VINCENZIO, *Castellana (Bari)*.  
Dark wine of 1861, at 3d. the litre.
- 720.**—692.\* DE MARTINO, GAETANO, *Salerno*.  
Two qualities of wine.
- 721.**—558. DE RUBERTIS, LUIGI, *Lucito (Molise)*.  
Wine, called Diavoleto, made with grapes thickened in the air; at 11d. the litre.
- 722.**—559. DI BLASIO, FELICE, *Bagnoli (Compobasso)*.  
Lavellato wine changed from cask to four times a year; at 2½d. the bottle.
- 723.**—696. FASCIA, *San Marco la Catola (Foggia)*.  
Wines.
- 724.**—698. FERRI, VITO, *Canneto (Bari)*.  
Musaglia wine of 1861, at 1 franc 50 cents. the litre.
- 725.**—FORNITI, FRANCESCO, *Popoli (Aquila)*.  
Wine.
- 726.**—564 bis. FRANCHI ROCCHI, BRIGIDA, *Popoli (Aquila)*.  
Wine.
- 727.**—703.\* GASPARRI, ANZELMO, *Biccari (Capitanata)*.  
White wine.
- 728.**—2140.\* GENOVESE ZERBI, DOMENICO, *Reggio (Calabria)*.  
Common wine of 1858.
- 729.**—704.\* GERVASIO, GIACOBBE, *Canneto (Bari)*.  
Zagarese wine of 1861, at 11d. the litre.
- 730.**—707.\* GIULIANI, LEONARDO, *San Marco in Lamis (Capitanata)*.  
Common wine.
- 731.**—2145.\* LOFARO, BASILIO, *Reggio (Calabria)*.  
Common wine of 1840, 1856, and 1859.
- 732.**—2146.\* LOMBARDI, —, *Sansevero (Capitanata)*.  
Wines.
- 733.**—2147\*. LUCERA (MAYOR OF), *Capitanata*.  
White wine.  
Red wine.
- 734.**—577. MADONNA, GIOVANNI, *Isola (Abruzzo Ulteriore I.)*.  
Old wines.
- 735.**—2154.\* MASSELLI, ANTONIO, *Sansevero (Capitanata)*.  
Wine.  
Vinegar.
- 736.**—TESONE, PASQUALE, *Popoli (Aquila)*.  
Wine.

**737.**—MANCINI, GIUSTINO, *Popoli* (*Aquila*).

Wine.

**738.**—2152\*. MARTINI, LUIGI, *S. Bartolomeo in Galdo* (*Benevento*).

Red wine.

**739.**—2156\*. MELISSARI, FRANCESCO SAVERIO, *Reggio* (*Calabria*).

Common wine of 1848, 1859, and 1860.

**740.**—587. MELLUSI, GIUSEPPE, *Torreclusi* (*Benevento*).

Torreclusi wine, obtained from Aglianico grapes, 5d. the litre.

**741.**—596. MONTERISI, GIUSEPPE, *Bari*.

White and black common wine, at 2d. the litre.

**742.**—600. MORTINI, LUIGI, *S. Bartolomeo in Galdo* (*Benevento*).

Wine of S. Bartolomeo in Galdo, made with the must of Aglianico grapes.

**743.**—600*bis*. MOSCHESE, CRISTOFORO, *Solmona* (*Aquila*).

Wine.

**744.**—603. NAPLES (SUB-COMMITTEE OF).

Posillipo wine.

Gragnano wine.

Ischia red wine.

Do. white wine.

Lachryma white wine.

Somma wine.

Capri red wine.

Do. white wine.

Asprino wine.

**745.**—2165.\* NOVA, DOMENICO, ANTONIO, *S. Agata* (*Foggia*).

Common wine.

Muscat wine.

**746.**—605. ORLANDO, GIOVANNI DONATO, *Naples*.

Pepolamazza wine (*Benevento*), made with Aglianico grapes, 40 cents.

**747.**—2167.\* PACCA, MARQUIS GIUSEPPE, *Benevento*.

Wine of the must of Aglianico grapes.

**748.**—608. PACIFICO, GIUSEPPE, *Salerno*.

Wine of 1860.

Natural Malaga wine from Salerno.

**749.**—2168.\* PAGANO, MICHELANGELO, *Pisciotta* (*Salerno*).

Cilento wine.

**750.**—2170.\* PALIZZI, CARLO, *Reggio* (*Calabria*).

Common wine of 1856 and 1859.

**751.**—609. PALUMBO, ORAZIO, *Trani* (*Bari*).

Ten years old Muscat wine.

Six years old Muscat wine.

Six years old Zagarese wine.

Ten years old Zagarese wine.

Six years old white wine.

Six years old Lacryma wine.

**752.**—610. PARENTE, CARLO, *Monterocchetto* (*Benevento*).

Red Mancusi wine, made with Aglianico grapes, at 5d. the litre.

**753.**—611. PARENTE, G., *Cepaloni (Benevento)*.

Red wine.

**754.**—2173. PASCAZIO, VITO, *Mola (Bari)*.

Common wines of 1859 and 1860,  
at 1*l.* 75*c.* the litre.

**755.**—621. PIZZI, LUIGI, *Petrella (Canpobosso)*.

Wine called Tintiglia of Spain.

Wine called Tiatico.

**756.**—628 *bis.* RELLEVA, SPERANZA, *Castelvecchio (Aquila)*.

Wine.

**757.**—2179. REGGIO (CALABRIA),  
(SUB-COMMITTEE OF).

	Price per litre.		
Common wine of 1844	2 <i>s.</i>	5 <i>d.</i>	
Do. 1850	2 <i>s.</i>	5 <i>d.</i>	
Do. 1856	2 <i>s.</i>	0 <i>d.</i>	
Do. 1859	1 <i>s.</i>	11 <i>d.</i>	
Do. 1861	0 <i>s.</i>	7 <i>d.</i>	

**758.**—636. SAGLIOCCA, GAETANO, *Pietralcino (Benevento)*.

Wine from Pietralcino, made in a  
peculiar manner with Aglianico  
must.

**759.**—638 *bis.* SANTARONI, ROMUALDO, *Naples*.

Red wine.

**760.**—2187.\* SANTORO, GABRIELE, *San' Agata*.

White wine.

**761.**—640. SANTO-SPACO, NICCOLÒ, *Castiglione alla Pescara (Teramo)*.

Muscat wine.

**762.**—645 *bis.* SIGNORINI, BROTHERS, *Aquila*.

Wine.

**763.**—2190. SOCCHERA, SAVINO, *Canosa (Bari)*.

Dark wine of 1861.

White wine of 1861.

**764.**—648. SPENSIERI, GIOVANNI, *Ferrazzano (Molise)*.

Wine from Verticchio of 1860.

**765.**—2196.\* SYLOS-LABINI, VINCENZO, *Bitonto (Bari)*.

White wine of 1861.

Black do. 1861.

Muscat do. 1861.

Zagarese wine.

**766.**—2197\*. TARANTINI, NICCOLÒ, *Corato (Bari)*.

	Per litre.		
Aleatico wine of 1861	.	.	3 <i>d.</i>
White do. 1861	.	.	2 <i>d.</i>
Black do. 1861	.	.	2 <i>d.</i>

**767.**—650. TARTAGLIOZZI, GIACOMO, *Isola (Teramo)*.

Old wine.

**768.**—702. TREJAVILLE, ANTONIO, *Cerignola (Foggia)*.

White wine.

Red wine.

**769.**—653. TOTORO, NICCOLÒ, *Archi (Chieti)*.

Wine boiled at 2*d.* the litre.

**770.**—658. VENTURA, VENANZIO, *Castiglione a la Pescara (Teramo)*.

Muscat wine.

**771.**—660. VIETRI, DOMENICO ANTONIO, *Salerno*.

Wine of two descriptions.

**772.**—662. ZICCARDI, VINCENZO, *Fojano (Benevento)*.

Fojano wine, made in a peculiar manner with Aglianico must.

#### SICILY.

**773.**—508. ALONZO, ANTONIO, *Catania*.

White wine from Fundo Fontana, on Etna.

White wine from Fontana Bosco.

**774.**—665. BARBAGALLO, SALVATORE, *Catania*.

Malaga wine from S. George, near Catania.

Muscat Frontignan wine.

**775.**—543. CLARKSON, SAMUELE VINCENZO, *Mazzara (Trapani)*.

Old Madeira wine.

Sweet Salamantino wine.

**776.**—685.\* COSTARELLI, MARTINO, *Catania*.

Rose wine from Nesima, near Catania.

**777.**—691. DEL TOSCANO, MARQUIS, *Catania*.

Amarena wine of 1857, from Nitta, near Catania, at 1s. 11d. the bottle.

White Nitta wine.

Calabrese wine of 1857, from Nitta, at 1s. 11d. the bottle.

Muscat wine of 1857, from Nitta, at 1s. 11d. the bottle.

**778.**—561. FAVARA VERDIRAME, VITO, *Mazzara (Trapani)*.

Common wine of the years 1855, 1859, 1860, and 1861.

Amarena wine of 1859 and 1861.

Salamantino sweet wine.

**779.**—697. FERRAROTTI, GIUSEPPE, *Catania*.

Old Muscat wine from Vittoria (Caltanissetta).

**780.**—699. FIAMMINGO, GIOVANNI BATTISTA, *Riposto (Catania)*.

Black Mascali wine.

**781.**—568 *bis.* GIOENI - TRIGONA, VINCENZO, *Catania*.

Wine.

**782.**—704 *bis.* GIOJA (MARQUIS OF), *Prince of Geraci*.

Lachryma wine.

Greek wine.

Asprino wine.

**783.**—2144.\* LELLA, GIUSEPPE, *Messina*.

Wine.

**784.**—2148.\* MAJORANA, BROTHERS, *Catania*.

Wines from Iroldo (Noto) six different qualities.

**785.**—2149.\* MANCUSO, MATTEO, *Catania*.

Wine from the plains of Catania.

**786.**—2159.\* MESSINA (SUB-COMMITTEE OF)

Collection of white and coloured wines, common, and for the table.

**787.**—591. MILAZZO (LOCAL EXHIBITORS' COMMITTEE, *Messina*.)

Natural wines.

**788.**—2160.\* MONCADA, ANDREA, *Catania*.

Bovara wine.

**789.**—2164.\* NESI, ANTONIO.

Common wine of 1858.

Do. do. 1861.

Expensive wine.

**790.**—614. PATRICO, VITO, *Trapani (Catania)*.

Wine.

**791.**—608 *bis*. PADRI DI MONTE CASSINO.

White wine from Bombacaro and the plains of Catania.

Dark wine.

**792.**—627 *bis*. RECUFERO, SALVATORE, *Barcellona (Messina)*.

Red wine.

**793.**—SAN FELICE (MONASTERY OF), *Catania*.

Common Nitta wine.

**794.**—2184.\* SAN FRANCESCO (MONASTERY OF), *Catania*.

San Francesco wine.

**795.**—2185.\* SAN PLACIDO (MONASTERY OF), *Catania*.

White Cardillo wine.

**796.**—2182.\* SANT AGOSTINO (MONASTERY OF), *Catania*.

Cardillo wine.

**797.**—2812 *bis*. SANTA AMADIA RUIZ, *Augusta*.

Various wines.

**798.**—2183. SANT' ANNA (HERMITS OF), *Catania*.

Dark Hermitage wine of 1857.

White Hermitage wine of 1857.

**799.**—506. AGNELLO, Baron, *Siculiana (Girgenti)*.

Muscat wine of Siculiana.

Common wine of Siculiana.

**800.**—2194. SISTO, Baron A., *Catania*.

1st quality Triti wine, near Catania.

Muscat wine of 1860, from Filiti, near Catania.

1st quality wine, from Catania.

1st quality wine of 1851, from Filiti.

**801.**—2200.\* TRAPANI, GIUSEPPE, *Gallico (Calabria Ulteriore I.)*.

Wine of 1846, 1852, and 1856.

**802.**—573. LIPARI (LOCAL EXHIBITORS' COMMITTEE).

White wine.

Red wine.

Malvasia wine.

#### SARDINIA.

**803.**—515. ASQUER, Viscount of, *Flumini (Cagliari)*.

Red wine from Campidano of Cagliari.

**804.**—531. CADONI, ANGELO, *Quartu (Cagliari)*.

Resiolu wine.

**805.—533. CAGLIARI (SUB-COMMITTEE OF).**

Common red wine from Campidano of Cagliari.  
 Common red wine from Ogliastro.  
 Common red wine from Sulcis.  
 Nasco white wine.  
 Malvasia white wine.  
 Cannonau white wine.  
 Pive white wine.  
 Monica white wine.  
 Vernaccia white wine.  
 Alcohol.

**806.—534. CARA, GAETANO, Cagliari.**

Dark wine of 1859.  
 Malvasia wine of 1859.  
 Monica wine of 1859.  
 Girò wine of 1859.

**807.—556. DEMURTAS, ELIA, Lanusei (Cagliari).**

Common red wine of 1861.  
 White wine of 1861.

**808.—564. FLORIS CAJANA, Paolo (Cagliari).**

Black wine.  
 Malvasia wine.

**809.—565. GARAUCARTA, LUIGI, Sanluri (Cagliari).**

Muscat wine.

**810.—566. GAVIANO, AGOSTINO, Lanusei (Cagliari).**

Common white wine of 1850.  
     Do.           do. 1860.  
     Do.           do. 1861.  
 Common red wine of 1860.  
     Do.           do. 1861.  
 Sparkling dark wine.  
 Cannonau wine of 1861.  
 Monica wine of 1861.

**811.—572. LAI, LUIGI, Lanusei (Cagliari).**

Common red wine of 1856.  
     Do.           do. 1860.  
     Do.           do. 1861.  
 Common white wine of 1861.  
 White Malvasia do. 1857.  
     Do.           do. 1858.  
     Do.           do. 1861.

**812.—580. MARINI-DEMURO, TOMMASO, Cagliari.**

Fine Sardinian wine.  
 Vinegar.

**813.—581. MARINI, PIETRO, Cagliari.**

Muscat wine.  
 Girò wine.  
 Malvasia wine.  
 Monica wine.

**814.—584. MASSONE, MARCELLO, Cagliari.**

Common dark wine from the Campidano of Cagliari.  
 White vinegar from the same locality.

**815.—586. MELIS, GIOVAN BATTISTA, Quartu (Cagliari).**

Monica wine.

**816.—601. MURGIA, GIUSEPPE, Sanluri (Cagliari).**

Malvasia of 1852.  
 Dark wine of 1853.

**817.—602. MURRU-MURRU, ANTONIO, Sanluri (Cagliari).**

Malvasia wine of 1859.

**818.—618. PERRA, ANTONIO, Cagliari.**

Common Pirri wine.  
 Common wine of various sorts.  
 Fine Muscat wine from Pirri.

**819.—625. PRUNAS, RAFFAELLO, Bosa (Cagliari).**

Malvasia, 1st quality.

Do. 2nd quality.

Do. 3rd quality.

White wine for the table, 1st quality.

White wine for the table, second quality.

White wine for the table, topaz colour.

Muscat wine, first quality.

Do. second quality.

White wine vinegar.

**820.—637. SALIS, FRANCESCO, Cagliari.**

Common wine.

Common white wine.

**821.—637 bis. SALIS, LUIGI, Lanusei (Cagliari).**

Common black wine of 1860.

**822.—638. SANNA, VINCENZO, Sellarigius (Cagliari).**

Common black wine.

Muscat wine.

**823.—641. SATTA FLORIS, RAFFAELLO, Cagliari.**

Girò wine.

Vernaccia wine.

Muscat wine.

Malvasia wine.

Cannonau wine.

Monica wine.

**824.—643 bis. SERRA, ANTONIO, Cagliari.**

Common Pirri wine.

Muscat wine of Pirri.

Fine muscat wine.

**825.—644. SERRA, LUIGI, Iglesias (Cagliari).**

Common Pirri wine.

Muscat wine.

Fine muscat wine.

**826.—646. SIRIGU, GIUSEPPE, Cagliari.**

Vermuth.

Vermuth of special fabrication, at 2s. 1d. the bottle.

**827.—2195.\* SPANO, PAOLO, Oristano (Cagliari).**

Vernaccia wine.

**828.—647. SPANO, LUIGI, Oristano (Cagliari).**

Vernaccia wine, from the valley of Tirso (Oristano).

Cruguese wine.

Muristella wine.

Asphodelus alcohol (*Asphodelus albus*).**BEER.**

In Italy, beer, when compared with wine, is an exceptional beverage; nevertheless, the want of wine, occasioned by the *oidium*, has stimulated and improved the production of beer, at the same time that the demand for a fermented beverage has sensibly increased.

In Lombardy there are at this time forty-one breweries, which brew annually thirty-two thousand hectolitres of beer; the province of Brescia has four, and Piedmont generally a large number. In Tuscany there is one brewery, at least, in each city or locality, of however little importance. Sicily has also some establishments of the same kind, upon a very respectable footing.

Bavarian and English beer is very well imitated, but the lighter and slightly bitter sorts of beer are preferred.

The materials used by brewers are, as elsewhere, barley and hops, the latter brought from Germany. Hops are cultivated in Italy (See Cl., 4.), on the mountains, but in no part on an extensive scale, and the flower is less aromatic than that grown in the North. The only samples of beer in the Exhibition are by

**829.—635. ROTA AND Co., Alessandria.**

Simple beer, at 3d. the bottle.

Double beer, at 8d. the bottle.

## ALCOHOL AND ALCOHOLIC LIQUORS.

Italy, previous to the vine disease, produced a large quantity of brandy and spirits, distilled by a simple apparatus, from wine and wine lees. At the present day, the high prices of wines and spirits, caused by the partial failure of the first and the increased consumption of alcoholic liquors, has caused an importation of spirits much larger than formerly, and the distillation of the fermented juices of a great number of fruits hitherto unused, as the arbutus (*Arbutus Unedo*), the white mulberry (*Morus alba*), the blackberry (*Rubus fruticosus*), the leaves of cherry laurel (*Prunus Laurocerasus*), common figs, Indian figs (*Opuntia vulgaris*). The same causes have produced the establishment or the greater development of some important distilleries, where alcohol is prepared, not only with the above substances, but even with the root of the *Helianthus tuberosus*, beetroot, and the grains of cereals.

The making of alcohol by means of asphodel sugar, has been tried in Sardinia, in Tuscany, and in Sicily. In Tuscany the yield of alcohol from this source was small, 4.14 per cent. upon the total weight of the article, or 7 per cent. upon the weight of saccharine matter, and the undertaking did not succeed. The extraction of alcohol from sorgho (*Sorghum glyciphyllum*) is more promising, especially in Sicily. The production of alcohol in Italy is much less than the consumption, although Sicily, according to the authority of the Chamber of Commerce of Catania, exports to Malta and England.

On the other hand, much activity exists, in all parts, in the manufacture of aromatic liqueurs, ratafias, and rosolios, both in imitating foreign productions, such as whiskey, rum, brandy, kirsch-wasser, extract of wormwood of Neufchâtel, Dutch curacao, chartreuse, &c., and in the manufacture of liqueurs peculiar to the country, as aniseed brandies and rosolios (*Fumetto, Rinfresco di Modena*) of the Bolognese and of Emilia, the rosolio, with flavour of bitter almonds (*Amaraschino di Zara*), the alcherimes of Florence, &c.

The making of whisky has been attempted at Florence by M. Bomboni; and that of milk punch, according to the English method, by M. Giordani, at Naples. Swiss wormwood is made almost everywhere, but with more success in Piedmont and in Leghorn. Some manufacturers, MM. Còra of Turin, and di Martini of Borgosesia, for example, produce 15,000 litres per annum.

The making of liqueurs, ratafias, and rosolios, which is well performed, employs many persons, and is carried on in some establishments, such as those of Contessini of Leghorn, Bovone of Genoa, Agnini of Finale of Modena, to an extent of more than £40,000 annually.

**830.—505.\* AGNINI, TOMMASO, Modena.**

Rosolio.

Rinfresco.

**831.—516. BALLOR, GIUSEPPE, Turin.**

Vermuth.

**832.—517. BARACCO, NICCOLÒ AND Co., Turin.**

Vermuth and various liqueurs.

**833.—666.\* BARI (SUB-COMMITTEE OF).**

Liqueurs.

**834.—667.\* BAZZIGER, L. AND Co., Sassuolo.**

Liqueurs.

**835.—669.\* BERTI, FRANCESCO AND GIUSEPPE, Rubiera (Reggio, Emilia).**

Aniseed, ratafia, rinfresco, or anacione di Rubiera.

Quinquina rosolio.

**836.—670.\* BIFFI, PAOLO, Milan.**

Liqueurs.

**837.—674.\* CAMPOLONGHI, GIOVAN BATTISTA, Parma.**

Rosolio.

- 838.**—675.\* CANTON, GIULIO, *Turin*.  
 Alkermes.  
 Liqueur of Raspail, hygienic.  
 Verdet from the coast of S. Andrea.  
 Vermuth.  
 Wormwood.  
 Curaçao.  
 Genepy from the Alps.  
 Swedish elixir.  
 117 years elixir.  
 Green water elixir.  
 Rectified essence of wormwood.  
 Concentrated essence to make wormwood instantly.
- 839.**—536. CARAMORA, PACIFICO, *Asti (Alessandria)*.  
 Extract of wormwood.  
 Wormwood from the territory of Asti, prepared by infusion and distillation.  
 Alkermes.
- 840.**—282. CHERICI, CLELIA, *Borgo San Sepolcro (Arezzo)*.  
 Alcohol and fruit of *Arbutus*.
- 841.**—545. COCCHI, FRANCESCO, *Reggio (Emilia)*.  
 Rosolio of aniseed, called Rinfresco.  
 Do. walnut water.  
 Do. Mistrà.
- 842.**—684.\* CORRIDI, GUSTAVO, *Leghorn*.  
 Alcohol.
- 843.**—693.\* DI GROSSI, GIUSEPPE, *Riposto (Catania)*.  
 Zambie of aniseed, liqueur.
- 844.**—694.\* EBOLI, NICCOLÒ, *Bari*.  
 Red and mandarin rosolio at 1s. the bottle.
- 845.**—699.\* FIAMMINGO, GIOVAN BATTISTA, *Riposto (Catania)*.  
 Wine alcohol at 36 degrees.
- 846.**—705.\* GIORDANO, GIUSEPPE, *Salerno*.  
 Alcohol of *Arbutus* and *Helianthus tuberosus*.
- 847.**—570. GROSSO, E., *Turin*.  
 Liqueurs.
- 848.**—2148.\* MAJORANA, BROTHERS, *Catania*.  
 Avola rum (Noto).
- 849.**—579. MARCHI, LEOPOLDO, *Volterra (Pisa)*.  
 Alcohol at 40 degrees, obtained by the distillation of the fruit of the *Arbutus Unedo*, at 8d. the kilo.  
 Alcohol obtained as above, from the fruit of the *Juniperus communis* (gin), at 1s. 5d. the kilo.
- 850.**—2151.\* MARCHI, PIETRO, *Florence*.  
 Alkermès.
- 851.**—582. MARGRETH, GIOVANNI, *Savona (Genoa)*.  
 Various liqueurs.
- 852.**—2157.\* MENGAZZI, FRANCESCO, *Cesena*.  
 Extract of wormwood.
- 853.**—598. MORANDO, IGNAZIO AND SON, *Sampierdarena (Genoa)*.  
 Garibaldi liqueur.  
 Italian punch.  
 Certosa (Chartreuse), white.  
 Bordeaux aniseed.  
 Curaçao.  
 Bottniax.

Ratafia.  
Balsam of Jerusalem.  
Wormwood.  
Mistrà.  
Ananas.

**854.**—2166.\* ORTONA (MUNICIPALITY OF), *Chieti*.

Centerba liqueur.  
Rosolio.

**855.**—2171.\* PARLATORE, Mrs. EUGENIA, *Florence*.

Alcohol and fruits of *Arbutus*.

**856.**—617. PERINI, PIETRO, *Desenzano (Brescia)*.

Various liqueurs.

**857.**—2174.\* PETROSEMILO, ANNIBALE, *Ortona*.

Liqueurs.

**858.**—2176.\* PRATI, GIUSEPPE, *Alessandria*.

Elixir of the Great St. Bernard.  
Liqueur made with the herbs of St. Bernard.

**859.**—626. RAPPIS, PIETRO, *Biella (Novara)*.

Various scented ratafia.

**860.**—2186.\* SANTA-SCOLASTICA (MONASTERY OF) *Bari*.

Red and white stomachic liquor, at 2s. 5d. the bottle.

**861.**—642. SAVORINI, FRANCESCO, *Persiceto (Bologna)*.

Anisette.  
Ratafia.

**862.**—2191.\* SCUDERI, FRANCESCO MARIA, *Catania*.

Zambic of fennel.

**863.**—645. SESIMA, V., *Alessandria*.

Liqueurs.

**864.**—2193. SINISCALCO, MICHELE, *Salerno*.

Plant of sea daffodil (*Pancratium maritimum*).

Flour extracted from ditto.

Alcohol of *Asphodelus ramosus*.

Alcohol of arbutus (*Arbutus Unedo*).

**865.**—649. SUPPA AND CASOLINO, *Trani (Terra di Bari)*.

Spirit of aniseed.

**866.**—651. TORO, BENIAMINO, FILENO, AND ENRICO, *Chieti*.

Mild and strong centerba.

Aromatic and stomachic liquor.

# VINEGAR.

Previously to the vine disease, wine held an important position in the manufacture of vinegar. Vinegar is still obtained in the ordinary way in farm and other households, where in general the proprietors are satisfied with allowing the wine to become vinegar in large open casks, which already contain some vinegar or the lees of vinegar.

There are in Piedmont two extensive vinegar yards, one at Turin, the other at Verduno, where the conversion of wine into vinegar is effected upon a large scale, a particular process, based on scientific principles, being economically practised. Vinegar from these establishments contains from 0.030 to 0.045 of acetic acid, and is sold at 2½d. to 4d. the litre.

An establishment exists in Venice for making vinegar from spirit distilled from corn, conducted on the method of Wigemann and Schutzenbach, which annually produces vinegar to the value of £40,000. This vinegar contains from 0.055 to 0.100 of acetic acid, and is sold at 1½d. to 3d. the litre.

The balsamic vinegars of Modena are a special production, obtained from the must of grapes, concentrated by heat, and to which a small quantity of old vinegar is added every year. At the same time a quantity of vinegar, equal to the quantity of must which is added, is drawn off, and the portion so drawn off is mixed with vinegar a year older, which in its turn is transferred to another tun, older still, and so on regularly, by which means vinegar from a hundred

to a hundred and fifty and even two hundred years old is obtained in the last cask of the series. These vinegar houses are the property of ancient families; that of the ducal house enjoys a distinguished reputation.

This vinegar is of a brown colour, rather thick, very fragrant, and possesses no quality in common with ordinary vinegar except the acidity, which is, however, not so strong. It is esteemed in proportion to its age, is expensive, and is used as an article of luxury as a perfume, either by itself, or by communicating its fragrance to common vinegar. Its chemical composition is not as yet ascertained, but probably it contains many combinations.

Vinegar is also obtained from certain fruits in Italy.

#### COMMON VINEGAR.

**867.**—709. GIOVENI, VINCENZO, *Catania*.

White vinegar.

**868.**—574. LORU, ANTIOCO, *Cagliari*.

White wine vinegar.

**869.**—2148. MAJORANA, BROTHERS, *Catania*.

Militello vinegar, 1st quality.

**870.**—634. RONCHI, PIETRO, *Florence*.

Old vinegar from common wine.

**871.**—2188. SARACENO, VINCENZO, *Catania*.

White Noto vinegar.

**872.**—2201. VAGLIASINDI, Baronet FRANCESCO, *Catania*.

White vinegar, from Randazzo, on Etna.

#### BALSAMIC VINEGAR.

**873.**—519. BELLENTANI, GIUSEPPE, *Modena*.

Common vinegar.

Aromatic vinegar.

**874.**—578. MALMUSI, CARLO, *Modena*.

Aromatic vinegar 200 years old.

**875.**—624. PRAMPOLINI, ANTONIO, *Reggio (Emilia)*.

Vinegar made with wine a century old.

(For Vinegars see N. 587, 616, 617, 657, &c.)

#### § 2. TOBACCO.

Numerous species and varieties of tobacco are cultivated in Italy; the most important of which are the common tobacco, (*Tabacco Brasile*, *Tabacco Monocos*) called also *Erba santa*, *Nicotiana rustica*, L.); the Virginian tobacco, (*Tabacco Cattaro leccese*) (*Nicotiana auriculata*, Bertol), *Cattaro forestiero* (*Nicotiana Tabacum*, var.) *Cattaro riccio* (*Nicotiana macrophylla*), tobacco with large leaves, and the Kentucky tobacco.

The cultivation of tobacco requires particular care, both in sowing and in transplanting, in order to preserve the young plants from frost and weeds. The plants require watering till the month of August, if the weather is dry.

Sixteen or eighteen leaves are left on the plant; subsequent leaves and flowers are cut off.

After the leaves are gathered, which takes place from August to October, the drying is proceeded with; then comes the first fermentation, which is obtained by placing the leaves in heaps of a certain size, which are turned over as occasion requires, according to well-known rules, till the middle of November, by which time the tobacco has acquired its special properties.

From experiments made in 1859, by M. Achille Bruni, of Barletta, it results that excellent tobacco may be procured by leaving upon the Virginian plants about eighteen or twenty leaves, the strongest of which should be about a metre in length, and twenty centimetres in breadth. Kentucky tobacco can bear as many as twenty-two leaves, as long and as broad as those of Virginia, but not so thick.

The manufacture of tobacco is carried on not only with the indigenous tobaccos, but also with those from India, America, Maryland, Virginia, Kentucky, Carolina, Havana, Turkey, Hungary, the Palatinat, Holland, &c. At Naples the indigenous tobacco forms about one-third of the manufacture; the province of Benevento produces tobacco to the value of 100,000 ducats, but in Northern Italy it is supplanted by foreign tobacco, which is preferred. The manufactories of Naples and Milan yield a million kilogrammes per annum.

There are manufactories of tobacco for smoking (*trinciati*); tobacco for cigars; and tobacco for rappee and other snuffs, more or less strong, to suit different tastes.

The tobacco manufactories have neither special processes nor particular machines; they are content to meet the requirements of the local demand.

The example of Sicily, where the production of tobacco is almost without restriction, and the recollection of privileges formerly enjoyed, excite a desire on the part of Italian agriculturists to regain those privileges; and from Sardinia and the southern provinces, where the tobacco plant thrives well, and from which parts specimens sent to the Italian Exhibition of 1861 were considered excellent, complaints are made of restrictions which limit production and paralyse the trade.

A free manufacture of tobacco would undoubtedly confer great economical advantages, but unfortunately this concession to the requirements of free-trade would have the serious effect of drying up one of the richest sources of revenue.

**876.—511. ALESSI, GIUSEPPE, Messina.**

Several qualities of tobacco leaves, from the province of Messina.

**877.—664. BALSAMO, G. N., Catania.**

Sticks of tobacco used in Sicily, letter B., four samples.

Sticks, letter C., five samples.

Sticks of foreign tobacco cultivated in Sicily, letter A.

Sticks of foreign and native tobacco, letter A.

Sticks of tobacco, native in Sicily, letter A., two samples.

**878.—522. BOLOGNA (ROYAL TOBACCO MANUFACTORY).**

Snuff.

Smoking tobacco.

Cigars.

**879.—525. BORALTO, DOMENICO, Alessandria.**

Native tobacco.

Kentucky tobacco.

**880.—528. BOZZO, MICHELE, Benevento.**

Brasils tobacco.

Virginia tobacco.

**881.—540. CASTIGLIONE DELLE STIVERE (LOCAL EXHIBITORS' COMMITTEE OF), Brescia.**

Tobacco called Solferino, in leaf, 1861.

Tobacco in powder, five qualities, of the years 1800, 1814, 1821, 1848, 1853.

The cultivation of tobacco was formerly much extended in this locality, under the domination of the Dukes of Gonzago, and a rather lucrative commerce was carried on with the provinces of the Venetian Republic.

**882.—532. CAGLIARI (ROYAL EXCISE OFFICE).**

Leaves of exotic tobacco for smoking, prepared at Cagliari, 1st quality, strong.

Do. ~~do.~~ do. 2nd quality, mild.

Do. do. 3rd quality, mild.

Common cigars.

Cigars, Swiss sort.

Snuff, prepared with native leaves of Monocos.

Senziglio tobacco, 1st quality.

Do. 2nd do.

Do. 3rd do.

**883.—563. FLORENCE (ROYAL TOBACCO MANUFACTORY).**

Snuff.

Paris.

Forcé.

Noble.

Macubino.

Albania.

Kentucky.

Smoking tobacco.

Trinciato of the Levant.

Kentucky Trinciato.

Common Trinciato.

Cigars from Hungarian tobacco.

Common cigars from Kentucky tobacco.

Cigars, Swiss sort.

Spagnolette (cigarettes).

**884.—575. LUCCA (ROYAL TOBACCO MANUFACTORY).**

Paris snuff.

Superior snuff.

Pizzichino snuff.

Noble snuff.

Macubino snuff.

Albania snuff.

Mild Trinciato smoking tobacco.

Strong Trinciato smoking tobacco.

Cigars, Havana sort.

Pressed cigars.

Cigars, Swiss sort.

Wevaislong cigars.

Fermented cigars.

**885.—2148. MAJORANA, BROTHERS, Catania.**

26 sorts of tobacco from Militello, of the years 1814 to 1858.

**886.—2153. MASSA CARRARA (ROYAL TOBACCO MANUFACTORY).**

Snuff, 8 qualities.

Saint-Vincent.

Pizzichino.

Macuba.

Scagliella.

Violette.

Naturel.

Rappee.

Trinciato tobacco, 1st quality.

Do. do. 2nd quality.

Cigars, 3 qualities.

National cigars.

Cigars of Masle.

Cigars, plain make.

**887.—589. MILAN (ROYAL TOBACCO MANUFACTORY).**

Fermented snuff, without smell, 1st quality.

Rose-scented tobacco, 1st quality.

Tobacco, 2nd quality, average.

Tobacco, 2nd quality, Albanian.

Tobacco, 2nd quality, violet Rappee.

Tobacco, 3rd quality, violet Rappee.

Tobacco Carada, 1st quality, coarse.

Tobacco Carada, 2nd quality, fine.

Tobacco, 2nd quality, Ancona description.

Tobacco, clear.

Tobacco, fine.

Smoking tobacco.

Strong Trinciato tobacco, 1st quality.

Mild Levant tobacco do.

Virginia cigars do.

**888.—592. MODENA (ROYAL TOBACCO MANUFACTORY).**

Snuff.

Paris Rappee.

Baton de montagne.

Carada, 1st and 2nd quality.

Natural rappee.

St. Vincent rappee.

Pizzichino.

Violet rappee.

Macouba.

Scaglietta.

Smoking tobaccos.

Mild Trinciato.

Strong Trinciato.

Superior cigars, 15s. the kilo.

Common cigars, Swiss sort.

Pressed cigars.

Natural cigars.

Two-pointed cigars.

Tariff price  
7s. 8d. the  
kilo.

4s. 4d. the  
kilo.

2s. 2d. the  
kilo.

4s. 4d. the  
kilo.

7s. 6d. the  
kilo.

**889.—2172.\* SESTRI-PONENTE (ROYAL TOBACCO MANUFACTORY).**

Tobaccos of various qualities.

Cigars.

**890.—654. TURIN (ROYAL TOBACCO MANUFACTORY).**

Rappee, 1st superior quality.

Rappee of 1st, 2nd, and 3rd quality.

Carada.

Zenziglio,

Trinciato, 1st superior quality, mild.

Strong trinciato.

Trinciato of 2nd quality.

Superior cigars.

National cigars.

Moro cigars.

Cigars, Swiss fashion, round.

Pressed cigars.

Rats' tail cigars.

Cigarettes.

# CLASS IV.

## ANIMAL AND VEGETABLE SUBSTANCES USED IN MANUFACTURES.

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### Classification.

#### SECTION I.

##### VEGETABLE KINGDOM.

*Sub-Class A. C. of the Official Classification.*

1. RESINS, GUMS, SACCHARINE SUBSTANCES.
2. OILS, SOAPS.
3. DYEING PLANTS.
4. TANNING SUBSTANCES.
5. TEXTILE SUBSTANCES.
6. WOOD, CORK.
7. PLANTS FOR DIFFERENT INDUSTRIAL USES.
8. HERBARIUMS.

#### SECTION II.

##### ANIMAL KINGDOM.

*Sub-Class B. of the Official Classification.*

9. WOOL AND HAIR.
  10. COCOONS AND SILKS.
  11. FAT, WAX, STEARINE.
  12. GLUE, ALBUMEN, BONES, AND VARIOUS MATTERS.
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### SECTION I.

#### VEGETABLE KINGDOM.

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### INTRODUCTORY REMARKS.

The number of primitive substances of a vegetable or animal nature, suitable for the purposes of manufacturing industry produced on Italian soil, are scarcely less than those productions of the same origin, which are used in a more direct manner as food. This results from identical causes, as it is owing to the geographical and topographical condition of the country that the soil furnishes such an infinite variety of productions. Many of these productions are of great value in a double point of view, being at the same time highly valuable as food and for industrial purposes.

For example, a number of the oils are used in the seasoning and preservation of food, and for lighting purposes; others, such as linseed oil, are used for painting, on account of their drying properties; others for medicinal purposes; and the whole may be employed in the manufacture of soap, alone or in combination with fatty matters of other origin.

The dyeing substances of Italy are particularly in request in France and England; the madder of the Southern Principalities and of Terra di Lavoro, the orchil of Sardinia and Pantellaria, the saffron of Aquila and Sicily, the safflower, the woad, the *scotano* or sumac of Venice. A large business is also carried on in tanning substances. We may also mention sumac (one of the chief sources of the riches of Sicily); the bark of the holm-oak, of the elm, and of the pomegranate; nutgalls; leaves of the myrtle and of the *Pistacia Lentiscus*. Nor let us forget the valuable fibrous plants; the hemp, so much in repute, of Bologna, Ferrara, Cesena, Ascoli, and Naples; the flax of Cremona, Lodi, and other parts of the valley of the Po; the aloes of Lecce, of Sicily, and Elba; the Esparto grass of Sicily, the brooms of Calabria; the cotton of Apulia, Calabria, and Sicily, the cultivation of which is daily increasing; other plants furnish, as it has been seen, sugar, alcohol, rum, such as the Chinese sorgho, beetroot, Lecce liquorice, Avola sugar-cane, *Asphodelus* and *Arbutus*. Certain plants furnish rosin, turpentine, pitch, and sandarach; others yield gums, which are used as substitutes for gum arabic, of which we have none. Numerous trees, such as the Norway spruce, the silver fir, the pine, the larch, the cypress, the yew, the walnut, the oak, the beech, the maple, the chestnut, the poplar, the olive-tree, the orange-tree, the alaterne-tree, the holly, and the carob, yield timber suitable for ship-building and the construction of dwellings, and for all kinds of cabinet and furniture work, as well as supplying bark for tanning and other purposes. Italy also produces cork; and its numerous mulberry-trees furnish the leaves so indispensable as food for silk-worms. An extraordinary quantity of plants supply materials for manufacturing and industrial purposes; the willow for the chairs of Chiavari, the much-prized chip-hats (*truciolo*) of the province of Modena; the dwarf-palm (*Chamaerops humilis*), with the leaves of which hats, baskets, brooms, and rope are made in Sicily; and lastly, wheat-straw, which is used for many purposes, especially for making straw hats, the manufacture of which gives employment to many families in the neighbourhood of Florence. At Syracuse, paper is made with the papyrus, in imitation of that of the Egyptians; the rush (*stiance*) is used to enclose wine bottles and oil flasks; and the willow and osier are used as a protection to larger glass bottles; reeds serve for many agricultural purposes and for building; with the *Chrysopogon Grillus*, brushes are made; with the sorgho, brooms; tinder is made of several sorts of mushrooms; the stalks of hemp are used for matches; the pine cones as fuel; the *baccici* for emulsions; cloth is carded with teazle; orris-root is used medicinally and as a perfume; and aniseed, coriander seed, fennel, and many other plants have important uses in perfumery.

Great wealth is derived from the numerous animals reared in Italy. The fleeces of merino sheep, either mixed with the native or other pure breeds, or the carefully-preserved breeds of the Tuscan maremmas and of some parts of Naples, possess valuable qualities, and need not fear competition with any other fleeces.

The Angola goats' hair promises to become a production of the mountains of Sicily. The silkworm yields a revenue of several millions sterling to Lombardy, Piedmont, Tuscany, the Marshes, and other provinces of Italy.

An attempt has been made in Italy to rear several other species of silkworms, the produce of which may compensate for their inferiority to the mulberry silkworm, by reason of their low price, and by the utilization of plants and soils hitherto unproductive.

The honey of Bormio has been considered by some superior to that of Chamonix and Switzerland; while the honey of Sardinia and Sicily recalls to mind the ancient honey of Hyble and the modern honey of Narbonne.

Sicilian cochineal will doubtless in future diminish the sum now annually paid to Mexico. The Italians skilfully work the native coral; they also collect sponges, of which there are such vast quantities in the seas which wash the southern coasts of the Peninsula and the larger islands; they make flowers and necklaces of the shells, and even gloves and shawls of the *byssus* of mother-of-pearl (*Nacchera*, *Pinna nobilis*). At Rome, from the *Albula* of the Tiber, is made the eastern essence used for the manufacture of false pearls; the skins of sharks are useful for joiners' work; the absence of the true tortoise-shell is supplied by an artificial manufacture, wrought in a marvellous manner at Naples. Geese, turkeys, and crows furnish quills; wild boars and pigs, bristles, to make brushes; horses, hair for plumes, mattresses, chair coverings, &c.; goats and bullocks furnish hoofs for different purposes; buffaloes furnish us with horns for combs, tobacco-boxes, and buttons; the bullocks of Naples and Sicily, those gigantic horns which are worked up into such a variety of useful and ornamental articles; bones are utilized for different purposes, for turnery, glue, gelatine, and manure; and the blood of these animals is useful both as manure and for the purpose of refining syrups.

In time, doubtless other produce will be obtained, and other occupations will spring up amongst us, especially through that knowledge of analogous objects acquired by means of International Exhibitions; and we do not doubt that we shall soon see mastic from the mastic tree, turpentine from the fir and the pine (now brought almost entirely from abroad); textile fibres from the pine-apple, the leaves of which are now thrown away, and the acclimatization of new plants and animals, to the great advantage of our manufactures and industry.

### § 1. GUM, RESIN, MANNA.

The gummy and resinous substances, whether obtained from wild or cultivated plants, are small in number, as the class of gum-bearing trees have few or no representatives in Italy.

Turpentine might hold a prominent place in Italy if it were industriously collected; it is as abundant with us as it is in the North, which produces the spirit known to commerce under the name of Strasbourg, Carpathian, and Venice turpentine, the latter of which was formerly manufactured at Venice in large quantities.

Turpentine is at present extracted from the cluster pine (*Pinus Pinaster*), generally known under the name of *Pino da fastella*, on account of its cones, which are used for fuel both in ordinary fire-places and in ovens. It grows wild in Italy, upon the sea-shore, as well as on the hills and mountains.

Sandarac is obtained, particularly in Tuscany, from the common juniper (*Juniperus communis*, L.), a plant which is very common in the hedges and in the wild parts of the peninsula.

The gum of the country flows naturally from the holes and crevices which exist in the bark of those trees bearing stone fruit, as the cherry, plum, and peach-trees. It differs from gum arabic in its reddish colour, and does not dissolve entirely in water; and the portion which is dissolved, under the name of *orichieco*, is not so viscous as the other. It is employed in the arts, and sometimes in veterinary medicine (*cerasine*).

Manna, very much used in medicine, is a sweetish substance, which is obtained from a species of ash (*Fraxinus Ornus*, L.), a timber-tree of the Mediterranean region of the peninsula, and of the Italian islands, cultivated chiefly in Calabria and in Sicily, in the mountains of the *Madonie*, where it is known by the name of *amolleo*.

Manna is obtained by means of oblique and horizontal notches made in the lower part of the trunk in the early days of July, or shortly afterwards, placing beneath a cup, made of the wood of the Indian fig tree (*Opuntia Ficus indica*, Mill.) After a week, during the dry season, the gathering is made; the manna which flows spontaneously from the trees is the *manna in tears*, the most esteemed, when it is pure; that which is procured with an iron pallet is the common manna (*manna in sorte*).

The groves of *amollei* are called *frassineti*. Soil adapted for its cultivation is not capable of growing anything else. The price is not high. The gross produce of a *frassinetto*

in Sicily is from 12 per cent. ; the net produce, deducting the cost of cultivation and imposts, may perhaps amount to about 9 per cent. The crop of manna, with that of saffron and liquorice, brings to the southern provinces about £120,000 at present. Formerly a crop of manna was gathered even in the Tuscan Maremmas, whence however there is now but a small supply.

**891.—978.\*AMICARELLI, VIN-  
CENZO, Monte Sant' Angelo (Capi-  
tanata).**

Rosin.

**892.—908. DE LUCA, PIETRO,  
San Giovanni in Fiore (Cala-  
bria).**

Rosin.

Black, or marine.

Greek pitch, or colophane.

Turpentine.

Nero di fumo.

These substances are derived from the clus-  
ter pine (*Pinus Pinaster*).

**893.—899. CAGLIARI (SUB-COM-  
MITTEE OF.)**

Gum from various trees.

**894.—2210.\*PALUMBO, ORAZIO  
Trani (Terra di Bari).**

Olive gum.

**895.—259. SPANO, LUIGI, Oris-  
tano.**

Prune gum.

Cherry gum.

Almond gum.

Orange gum.

**896.—215. RIETI (SUB-COMMITTEE  
OF).**

Cherry gum.

**897.—241.\*GIORDANO, DOMENICO,  
Cetara (Salerno).**

Manna in tubes.

**898.—280. MORELLI, GIOVANNI,  
Rogliano (Calabria).**

Manna in tubes.

Do. in tears.

Do. common.

## § 2. OILS.

### OLIVE OILS.

Italy and the Italian Islands produce many sorts of oil, amongst which Olive oil must first be noticed, being worthy of its ancient renown on account of its good quality, its abundance, its use, and its importance as an article of commerce.

The olive tree, from the fruit of which the oil is obtained, grows naturally in the woods and copses near the coast on the southern parts of the Peninsula and the Italian Islands, as also in Greece and Asia Minor, and in the southern parts of France and Spain, and on the coasts of Africa. Wild olive trees, or *olivastri*, are sometimes of gigantic size, having a very thick foliage, particularly in our islands. A temperature of seven or eight degrees centigrade below zero being prejudicial to their growth, wild olive trees, like those which are cultivated, require a mild winter, with a hot summer and autumn to ripen the fruit; olive oil, however, is obtained from cultivated olive-trees, of which there are many sorts, the *frantoio*, the *morajolo*, the *leccino*, and others still more or less esteemed for the quantity and quality of their fruit. The best olive oils come from the coast of Nice, Genoa, Lucca, and Tuscany. Excellent oils are also obtained from Naples and Sicily, and they are at all times a source of great wealth for certain parts of the country. The total production is estimated at 1,767,000 hectolitres, of which 124,000 are from Liguria. The province of Lucca alone derives nearly £40,000 annually from it; and even exports to America. Tuscany exports olive oil to the value of nearly £80,000; and the Neapolitan provinces export annually to the extent of about £740,000.

The different kinds of oils are distinguished according to their quality and the mode of preparation. The finest and the most esteemed description is fluid, of a yellow straw, or yellow citron colour, rarely white, colourless, sweetish, sometimes greenish, almost always clear, without any smell, in taste insipid, or at least slightly bitter, with a fruity flavour. It is obtained from perfectly sound and fresh olives, after being crushed and squeezed, without previous fermentation. This is what is called virgin oil, oil of first quality; this oil is used

pre-eminently for seasoning, and is known to commerce under the denomination of Oil of Nice, Lucca Oil, or Italian Oil.

The paste of olives, passed through a mill after the first squeezing, and allowed to remain undisturbed for some time, then pressed again, produces a fresh quantity of oil, inferior in quality to the above, and which may be designated as second quality. Treated with boiling water the paste furnishes a further quantity of oil, inferior to the above. This oil is clear, of a rather strong citron colour, but sometimes quite colourless, of a fatty flavour, slightly rancid, and sometimes also it has a little sulphurous taste. It is used for burning, or for making soap.

The residuary matter, treated again with water, by means of machines called *frullini*, yields a further quantity of highly-coloured thick cloudy oil, used for manufacturing purposes, and which is called oil of *frullino*.

In order to extract the whole quantity from the residue it is treated with sulphur of carbon, which succeeds in extracting a still further yield. Recently, Messrs. Danielli, of Buti, have offered for sale an oil of *lotis* (*Olio dei loti*), green, in a half concrete state, which nevertheless is capable of becoming limpid and is inflammable, and which they obtain by a process of their own, utilizing about 1 per cent. of the matter treated.

In places where the extraction of the oil is less carefully attended to than in Italy, and amongst oil growers who are not so particular about the quality of their produce, very little virgin, or first quality oil, is made, as it is much more easy to obtain olive oil fermented, or artificially treated, and this with some appearance of a much larger yield, but then they only produce inferior oil.

The consumption of olive oil in Italy forms an important item in the wants of the table, and for lighting purposes and soap making. The Venetians were the first to use oil in making soap, which was previously made from fatty matters. The best oil sells at from 1s. 2d. to 1s. 4d. the kilo., according to the year. An oil of inferior quality, for lighting purposes, is extracted from olive nuts. The *stiacciate* or *panelle* is used for feeding cattle.

#### LIGURIA, TUSCANY.

899.—873.\* ALBIANI, FRANCESCO,  
*Pietrasanta (Lucca).*

Olive oil.

900.—713. BANCALARI, LAZZARO,  
*Chiavari (Genoa).*

Olive oil.

901.—781. BERNARDI, FRANCESCO,  
*Sienna.*

Olive oil.

902.—719. BOTTEGHI, ALESSAN-  
DRO, *Chiavari (Genoa).*

Olive oil.

903.—718. BOTTI, ALESSANDRO,  
*Chiavari (Genoa).*

Olive oil.

904.—721. CATTANEO, GIOVAN  
BATTISTA, *Chiavari (Genoa).*

Olive oil.

905.—722. CONTI, BASILIO, *Ponte-  
dera (Pisa).*

Olive oil.

906. 792.\* CORSINI, ELEONORA,  
*San Casciano (Pisa).*

Olive oil.

907.—724. DANIELLI AND FIL-  
LIPPI, DOMENICO AND FERDI-  
NANDO, *Buti (Pisa).*

Olive oil.

Do. of dry olive.

Do. in spirit.

908.—727. DE GORI, Count Au-  
gusto, *Sienna.*

Olive oil of Valdichiana.

909.—731. FRANCIOSI, PIETRO,  
*Terricciola (Pisa).*

Olive oil.

**910.—737. GIUSTI, NATALE, Pisa.**

Olive oil, prepared by the old processes.

Do. common, prepared by new processes.

Do. extra fine, prepared by a new process.

**911.—738. GRISALDI DEL TAIA, CARLO, Sienna.**

Olive oil.

**912.—817\*. MANNELLI-GALLILEI, LUIGI, Pontedera (Pisa).**

Olive oil.

**913.—812\*. MASETTI, Count PIETRO, Florence.**

Five qualities of oil gathered in five different localities.

**914.—743. MASTIANI-SCIAMANNA, Marquis CESARE, Pisa.**

Three qualities of oil produced on the hills of Pisa.

**915.—745. MAZZAROSA, Marquis GIOVAN BATTISTA, Lucca.**

Olive oil.

**916.—748. MILIANI, FRANCESCO, Peccioli (Pisa).**

Olive oil of 1861.

**917.—750. MINUTOLI-SEGRINI, Count EUGENIO, Lucca.**

Olive oil from the farms of Saint Amato, near Pistoja.

Do. from the farm of Vorno, near Lucca.

Do. from the farm of Massaciucoli, near Viareggio.

**918.—819\*. NALDINI, BENEDETTO, Florence.**

Olive oil, cold drawn.

Do. of 1859, extracted from olives called *frantoje*.

Do. of 1861, cold drawn from olives of various sorts.

**919.—754. OREGGIA, CRISTOFORO, Savona (Genoa).**

Olive oil.

**920.—756. OTTOLINO-BALBANI, Countess CAROLINA, Lucca.**

Olive oil from her property in Vico-pelago, near Lucca.

**921.—2216.\* PICCARDI, GIUSEPPE, San Casciano (Florence).**

Olive oil of 1860 and 1861.

**922.—759. PIERI-PECCI, Count GIOVANNI, Sienna.**

Olive oil from the neighbourhood of Sienna.

Common olive oil.

Best olive oil.

**923.—2219.\* RICASOLI, Baron BETTINO, Sienna.**

Olive oil.

**924.—763. RICCARDI-STROZZI, CARLO, Florence.**

Oil from Querceto, province of Florence.

Oil from Panieretta, province of Sienna.

**925.—2221.\* ROSPIGLIOSI, Prince, Pistoja.**

Olive oil.

**926.—764. SARDINI, GIACOMO, Lucca.**

Best olive oil from the southern parts of Lucca.

Oil of an inferior quality, called *di frullino*, from the same locality.

**927.—769. TALENTI, Count LUIGI, Lucca.**

Best olive oil from S. Lorenzo á Vaccoli, near Lucca of 1561 and 1564.

From Bozzano, near Viareggio.  
Oil of 1861.  
Oil from Bozzano, near Viareggio, of  
1861.

# UMBRIA.

**928.**—710. ALFANI, CONCETTA,  
*Nocera.*

Olive oil.

**929.** 774.\* ARPINI, EMILIO,  
*Ascoli.*

Olive oil.

**930.**—785.\* CANTALAMESSA,  
IGINO, *Ascoli.*

Olive oil.

**931.**—725. DANZETTA, Baron,  
BROTHERS, *Perugia.*

Olive oil from the shores of the Lake  
Trasimeno.

**932.**—810.\* MACERATA (SUB-  
COMMITTEE OF)

Olive oil.

Sansa oil.

**933.**—815. MERCATILE, MI-  
CHELE, *Ascoli.*

Olive oil.

**934.**—2215.\* PESCI, GIOVANNI,  
*Perugia.*

Olive oil.

**935.**—2214.\* PESARO (AGRICUL-  
TURAL ACADEMY)

Olive oil.

Oil from olive kernels.

# SOUTHERN PROVINCES.

**936.**—772bis. AICARDI, L. C., *Bari.*  
Superfine and common olive oil.

**937.**—575.\* ARRANGA, GIO-  
VANNI ANGELO, *Serracapriola.*  
Olive oil.

**938.**—715. BARACCO, BROTHERS,  
*Cotrone (Catanzero).*

Olive oil.

**939.**—777. BARBATO, NICCOLÒ,  
*Sant'Agata (Foggia).*

Olive oil.

**940.**—714. BARTOLINI, CARLO,  
*Cosenza.*

Oil from the coasts of the Ionian  
Sea.

Oil from the coasts of the Mediter-  
ranean.

Oil from the neighbourhood of  
Cosenza.

**941.**—717. BELLELA, ENRICO,  
*Capaccio.*

Oil.

**942.**—797.\* DELLA BELLA,  
DIONISIO, *Vico (Foggia).*

Olive oil.

**943.**—716. BELTRANI, GIUSEPPE,  
*Trani (Bari).*

Fine oil.

Common oil.

**944.**—782.\* BOCCARDO, BRO-  
THERS, *Candela (Foggia).*

Olive oil.

**945.**—784.\* CANOSA, (MUNICI-  
PALITY OF), *Terra di Bari.*

Olive oil.

**946.**—786\*. CARDUCCI, ANDREA,  
*Taranto (Terra d'Otranto).*

Olive oil.

**947.—787.\* CASALTRINITA,**  
MAYOR OF.

Olive oil.

**948.—788.\* CASERTA** (SUB-COM-  
MITTEE OF).

Very fine eating olive oil, from Cen-  
turano.

Do. from Garzano.

Do. from Briano.

Do. from St. Peter and  
St. Paul.

Do. of ground nut, from  
Caserta pleasure-garden.

Do. from Egypt.

Do. sugared.

**949.—726. DE CESARE, ANTONIO,**  
*Penna (Teramo).*

Olive oil.

**950.—791. CONSTANTINO, GIU-  
SEPPE, S. Marco di Cavoti (Be-  
nevento).**

Oil.

**951.—793.\* D'AMBROSIO, LUIGI,**  
*Deliceto (Foggia).*

Olive oil.

**952.—794.\* DE BIASE, GIUSEPPE,**  
*S. Marco la Catola (Foggia).*

Olive oil.

**953.—722. DE RUBERTIS, LUIGI,**  
*Lucito (Campobasso).*

Olive oil made at Lucito.

**954.—800.\* DI RIGNANO, Mar-  
quis, Foggia (Capitanata).**

Olive oil.

**955.—796.\* D'ERCHIA, ANGELO,**  
*Monopoli (Bari).*

Fine oil of 1861.

Common oil of 1861.

**956.—798.\* DEL'ERMA, VICENZO,**  
*Castellana (Bari).*

Fine oil of 1861, first quality.

**957.—733. GABRIELE, ANTONIO,**  
*S. Bartolomeo in Galdo (Bene-  
vento).*

Collection of oils of S. Bartolomeo  
in Galdo.

**958.—802.\* GASPARRI, ANTONIO,**  
*Biccari (Foggia).*

Olive oil.

**959.—803.\* GIOJA, ANTONIO, Co-  
rato (Bari).**

Fine and common oil of 1861.

**960.—736. GIORDANO, GIULIANO,**  
*Naples.*

Collection of oils.

**961.—(Wanting).**

**962. 806.\* IDONE, GIACOMO,**  
*Lecce (Terra di Otranto).*

Olive oil.

**963.—807.\* LOMONACO, LUIGI**  
*GIUSEPPE, Corato (Bari).*

Fine oil of 1861.

**964.—739. LUPINACCI, LUIGI**  
*AND BROTHERS, Cosenza,*

Olive oil.

Price 5d. the litre.

**965.—811.\* MANNI, DOMENICO,**  
*Tocco (Chieti).*

Sweet olive oil, very fine.

**966.—813.\* MASSELLI, ANTONIO,**  
*San Severo (Foggia).*

Olive oil.

**967.**—816.\* MILELLA, GIUSEPPE,  
*Bari.*

Fine olive oil of 1861.

**968.**—814.\* MELISARI, FRAN-  
CESCO SAVERIO, *Reggio (Calab-  
bria).*

Olive oil from Borrace.

**969.**—752. MOSCERO, GIOVANNI,  
*Cosenza.*

Olive oil.

**970.**—2206.\* NOVI, DOMENICO  
ANTONIO, *S. Agata (Capitanata).*

Olive oil.

**971.**—755. ORLANDO, G., *Pesciola  
Mazza (Benevento).*

Oil.

**972.**—2207.\* ORTONA, MUNICI-  
PALITY OF), *Abruzzi.*

Olive oil.

**973.**—2208. PACCA, 'Marquis GIU-  
SEPPE, *Benevento.*

Oil of the ripe olive tree.

**974.**—2209.\* PALIZZI, CARLO,  
*Reggio (Cagliari).*

Olive oil from Palizzi.

**975.**—2211.\* PAOLELLA, GIU-  
SEPPE, *Foggia.*

Olive oil.

**976.**—2212.\* PASCAZIO, VITO,  
*Mola (Bari).*

Fine unfiltered oil.

**977.**—2218.\* REGGIO, CALABRIA  
SUB-COMMITTEE OF),

Olive oil.

**978.**—(Wanting.)

**979.**—2222.\* SANSONE, PASQUALE,  
*Cagnano (Foggia).*

Olive oil.

**980.**—799.\* DELLI-SANTI, FRAN-  
CESCO, *Manfredonia (Foggia).*

Olive oil.

**981.**—2223.\* SANTORO, GABRIELLO,  
*S. Agata (Foggia).*

Olive oil.

**982.**—2224.\* SAULLI, LUCIANO,  
*Piscialata (Salerno).*

Olive oil of Cilento.

**983.**—2229.\* SCARIGLIA, MARCO,  
*Bescoti.*

Olive oil.

**984.**—2226.\* SCOCCHERA, SA-  
VINO, *Canosa (Bari).*

Fine oil of 1861.

**985.**—2227. SERRACAPRIOLA  
(MUNICIPALITY OF), *Capitanata.*

Olive oil.

**986.**—2236. SIGNORINI, BRO-  
THERS, *Aquila.*

Olive oil.

**987.**—2230. SYLOS-LABINI,  
VINCENTO, *Bitonto (Bari).*

Fine oil of 1861.

Common oil of 1861.

Do. from olive kernels of 1861.

**988.**—801.\* TREJAVILLE, AN-  
TONIO, *Cerignola (Foggia).*

Olive oil.

## SICILY.

989.—2237. MARCHESE, CRISTO-  
FORO, *Mazzara*.  
Olive oil.

990.—744. MAZZULLO, GIUSEPPE,  
*Mandanici (Messina)*.  
Olive oil.

991.—746. MESSINA (SUB-COM-  
MITTEE).  
Many qualities of oil of the terri-  
tory of Messina.

992.—747. MILAZZO, (LOCAL  
EXHIBITORS' COMMITTEE). *Mes-  
sina*.  
Samples of olive oil.

993.—765. SCUDERI, ANTONIO,  
*Messina*  
Olive oil.

## SARDINIA.

994.—783.\* CAGLIARI, SUB-  
COMMITTEE of.  
Olive oil, 1st quality.  
Do. 2nd quality,

995.—2205.\* NIEDDA DI SANTA  
MARGHERITA, Count PIETRO,  
*Cagliari*.  
Olive oil.

996.—753 *bis*. NISSA, Marquis,  
*Cagliari*.  
Virgin olive oil.  
Common olive oil.  
White olive oil.  
Sansa oil, 1st quality.  
Sansa oil, 2nd quality.

997.—760. PISTIS, G., *Elini*  
(*Cagliari*).  
Common olive oil.  
Select olive oil.

998.—2217.\* PORTO-MAURIZIO,  
(SUB-COMMITTEE OF).  
Fine olive oil.

999.—761. PRUNAS, RAFFAELLO,  
*Cagliari*.  
Olive oil.

1000.—766. SPANO, LUIGI, *Oris-  
tano (Cagliari)*.  
Olive oil.

## OLEAGINOUS SEEDS AND VARIOUS OILS.

In the provinces of the Peninsula where the olive does not grow spontaneously, and cannot be cultivated except in certain places having an equal temperature, as on the banks of the lakes, walnut trees have been planted from time immemorial; they yield an oil which, when fresh, is used for food and lighting purposes, or for painting when it becomes rancid.

In the north of Italy, in the valleys of the Alps, and also of the Apennines, the walnut-tree forms, and gives its name to a special botanical region. The importance of nut-oil has diminished since the introduction of the turnip (*Navone*, or *Ravizzone Brassica Napus*, L.) and of the Colza (*Brassica campestris*, L.), the seeds of which yield a good oil, and which are used for culinary and for lighting purposes.

For the same objects the *Camelina sativa* is also cultivated, but in less quantities; and in the Novarese, in the Vicentino, and elsewhere, an attempt has been made to cultivate the ground-nut (*Archie hypogæa*), a small plant which conceals its husks under ground, and which in hot countries, and in fresh soils, yields more than half the weight of its seed in oil, of sufficient good quality to bear a comparison with the best olive oil. M. Filippo Majorana has persevered in developing the cultivation of this vegetable in Sicily, the merit of which, appertaining to him, cannot be better appropriated.

Another important oleaginous plant is cultivated in Sicily, that of the *Sesame* (*Sesamum orientale*, L.), commonly called *Giuggiolena*. It is a small annual plant, which, sown at the end of May, yields its produce during the summer. The inhabitants strew their bread with its seeds, which impart to it a pungent flavour. They also make comfits or *turroni*

of it. They extract very little oil from it, but in consequence of the bad crops of olive during the last few years, the trade has been compelled to have recourse to the Sesame and we hope to see a great increase in the cultivation of this plant in Sicily, which will rival the olive both in quality and the quantity of its oil.

At Leghorn and at Turin there are already large manufactories of Sesame oil.

The extraction of linseed oil has given rise to extensive manufactories. The establishment of M. Giovanni Battista Menotti, of Pistoja, produces annually about seventy-thousand kilogrammes of linseed and rape oil, by the employment of very powerful mechanical presses.

The Association of the New Industry at Leghorn, which has at work eight hydraulic presses and a steam-engine of 15 horse-power, produces nearly 550,000 kilogrammes of oil. This oil is scarcely ever used for culinary purposes; it is of great use for painting, for lighting, and for varnishes suitable for cabinet makers. M. Ombroni, upon Lake Como, has also a large establishment for the extraction of different oils.

Port St. Stefano, in Tuscany, has a manufactory of oil of *Pistacia Lentiscus*, which is commonly used for lighting, and even for culinary purposes. When thus applied it is deprived of its offensive smell by heating it with crumbs of bread. Apulia carries on a large trade of *Lentiscus* oil with Egypt. A large trade in castor oil is carried on to supply the demands of pharmacy and soap-making. Many other oils are used for different economical or industrial purposes—as almond oil for medicine, nuts, beech mast (*falne*), fagginole, *Fagus sylvatica*, L.), juniper (*Juniperus communis*, L.), laurel (*Laurus nobilis*), cotton seed (*Gossypium herbaceum*), and grapestones for lighting purposes. This last oil, which presents a new product of the grape, is extracted especially in Modena, in which it is an old source of profit.

**1001.**—353.\* ASCOLI (SUB-COMMITTEE OF).

Linseed.

**1002.**—772.\* AGAZZOTTI, ADOLFO FRANCESCO, *Modena*.

Walnut oil.

**1003.**—884. BAFFONI, V., *Fermo* (*Ascoli*).

Oil of grapestones (*Vinnaccioli*).

Oil of rapeseed.

**1004.**—778.\* BASTONI, VINCENZO, *Turin*.

Oil of grapestones.

Oil of turnip, and of grapestones, to burn.

**1005.**—783.\* CAGLIARI (SUB-COMMITTEE).

Almond oil.

Oil of *Pistacia Lentiscus*.

**1006.**—805.\* GIRARDI, MARTINO, *Turin*.

Hazel nut oil.

Walnut oil.

Cooked walnut oil.

Grapestone oil.

Almond oil.

Colza oil.

Linseed oil.

Castor oil.

Oil of *Pistacia Lentiscus*.

**1007.**—920. GUIDA, BROTHERS, *Gargarengo* (*Novara*).

Colza plant.

Rape plant.

White rape plant.

**1008.**—928. MAJORANA, BROTHERS, *Catania*.

Seeds of dark red mustard.

Seeds of *Sesamum*.

**1009.**—742. MARCHI, LEOPOLDO, *Volterra*.

Oil of *Pistacia Lentiscus*; Price 8d.

**1010.**—749. MILAN (CHAMBER OF COMMERCE OF).

Collection of many qualities of oil.

**1011.—751. MODENA** (SUB-COMMITTEE OF).

Oil of grapestone.  
Turnip oil.  
Walnut oil.  
Linseed oil.

**1012.—2213.\* PAULUCCI, MARQUIS GIOVAN BATTISTA, Forlì.**

Oil of seed of *Kölreuteria paniculata*.

**1013.—1241.\* REGGIO, EMILIA** (AGRICULTURAL COMMISSION OF).

Turnip.  
Rape.  
Colza.  
Linseed.

**1014.—762. REGGIO EMILIA** (AGRICULTURAL SOCIETY OF).

Linseed oil.  
Turnip oil.  
Walnut oil.  
Grapestone oil.

**1015.—950. RIETI** (SUB-COMMITTEE OF)

Castor oil.  
Mustard.

**1016.—2126.\* SCOCCHERA, SAVINO, Canosa (Terra di Bari).**

Castor oil.

**1017.—957. SERRA, LUIGI, Iglesias (Cagliari).**

Flumini linseed oil.  
Villaperuccio linseed oil.

**1018.—2231.\* TESI, LEOPOLDO, Pistoja.**

Virgin olive oil of Groppoli.  
Common olive oil.  
Linseed oil.  
Cold drawn linseed oil.  
Turnip oil.

**1019.—771. VACCARO, LUIGI, Cosenza.**

Ground nut oil.

(For castor oil, see class 2, Nos. 299, 303, 314, pages 79 and 80.)

## SOAPS.

Italian soaps are sufficiently appreciated to take rank with those of France and Germany. Numerous soap manufactories exist in Italy, especially in the provinces of Lombardy, Emilia, Tuscany and Sicily, which obtain soap from olive oil, cocoa oil, olefine from the stearine manufactories, fats, and resins. All descriptions are manufactured, for fulling cloth, for silk, for cleaning lace, and for the toilet, &c. The qualities used for silk and wool are exported to Switzerland, Holland, the United States, and even to England. The manufactory of M. Hugo Conti, of Leghorn, one of the most important, produces chiefly the following soaps:—

**WHITE LIQUID OLIVE OIL.**—The manufacturer has discovered a method of making this of pure quality, and adapted it for special use in silk dyeing, red cotton, and lace cleaning.

**WHITE FLOATING OIL OF OLIVES.**—This soap, being lighter than water, floats on its surface, and laundresses know how to appreciate it, as they are not liable to lose it when washing in running water.

**WHITE FAT, or marine soap**, which has the property of turning white in sea water.

Red marbled, 1st quality } Olive oil.  
Red marbled, 2nd quality }

Very economical for domestic use, and is in great demand for taking the grease out of wool.

This last manufacture produces annually a value of £22,400; 580,000 kilogrammes of different kinds of soap. The ingredients employed are:—Olive oil, 300,000 kilogrammes, to the value of £13,600; palm oil, cocoa nut oil, &c., to the value of £2,600; different qualities of soda, to the value of £2,200. Nearly 200,000 kilogrammes of this soap are exported, principally to America. There is in Liguria, St. Pier de Arena, a large manufactory, the produce of which amounts to 17,000 metrical quintals, and important establishments at Parma, Bologna, Ancona, &c., for the manufacture of soap from resin, tallow, fat, &c.; there is

also one at Tesi (Ancona). Notwithstanding the duties upon colophony, there is a manufactory which uses up 80,000 kilogrammes of colophony and 50,000 kilogrammes of tallow.

The soaps of Italy, which have to compete with those of Marseilles and Trieste, are nevertheless exported to a considerable extent.

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| <p><b>1020.</b>—776.* <b>BARBAGALLO</b>,<br/>SALVATORE, <i>Catania</i>.<br/>Strong and soft soap.<br/>Tallow.<br/>Linseed oil of St. George.</p> <p><b>1021.</b>—789.* <b>CASTORINA</b>, <i>Catania</i>.<br/>Soft soap £1 18s. 2d. the kilogramme.</p> <p><b>1022.</b>—723. <b>CONTI</b>, ENRICO, <i>Leghorn</i>.<br/>Many qualities of soap.</p> <p><b>1023.</b>—790.* <b>COSENTINO</b>, STEFANO, <i>Catania</i>.<br/>Soft soap £1 18s. 2d. the kilogramme.</p> <p><b>1024.</b>—796. <b>D'ERCHIA</b>, ANGELO, <i>Monopoli (Bari)</i>.<br/>Common soap.</p> <p><b>1025.</b>—730. <b>DUNANT</b>, ANGELO, <i>Milan</i>.<br/>Collection of toilet soaps and other articles of perfumery.</p> <p><b>1026.</b>—732. <b>FURLANI</b>, GIOVANNI, <i>Florence</i>.<br/>Various soaps.</p> | <p><b>1027.</b>—809.* <b>LOFARO</b>, FRANCESCO, <i>Catania</i>.<br/>Soft soap £1 18s. 2d. the kilogramme.</p> <p><b>1028.</b>—740.* <b>MAJORANA</b>, BROTHERS, <i>Catania</i>.<br/>Hard soap.</p> <p><b>1029.</b>—741. <b>MANGANONI</b>, LUIGI, <i>Milan</i>.<br/>Soap.<br/>Stearine wax candles.</p> <p><b>1030.</b>—753. <b>NOBERASCO</b> AND <b>ACQUARONE</b>, <i>Savona (Genoa)</i>.<br/>Soap.</p> <p><b>1031.</b>—757. <b>PANCANI</b>, BROTHERS, <i>Florence</i>.<br/>Olive oil soap.<br/>Palm oil soap.<br/>Animal oil soap.</p> <p><b>1032.</b>—2275.* <b>PRANZINI</b>, LORENZO, <i>Florence</i>.<br/>Toilet soaps.</p> <p><b>1033.</b>—770. <b>TURCHI</b>, LUIGI, <i>Pontelagoscuro (Ferrara)</i>.<br/>Olive oil soap.<br/>Palm oil soap.</p> |
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### § 3. DYEING SUBSTANCES.

Madder is the most important dyeing plant in Italy, and is that which yields a red colour with its various shades. Madder (*Robbia*, *Rubia tinctorum* L.) grows in a wild state in the Peninsula and in the Italian islands; but it has been cultivated during a very long time in Italy, as may be seen in the works of ancient Greek and Latin writers.

Dioscorides speaks of the Tuscan madder as the best in his time. The same value was attached to it in the middle ages, but its cultivation was abandoned in consequence of the decay of the manufacture of cloth, which commenced in Tuscany in the 15th century. In later times the demands of France and England for the madder of Cyprus, Smyrna, and other parts of the Levant, encouraged the Italians to resume its cultivation. In Tuscany, near Campiglia, in Umbria, in the Southern Principalities, in the Lavoro territory, and particularly near Salerno,

madder is cultivated on a large scale, and is exported with a profit for the purpose of dyeing cloths and cotton red. In those places where there is a great production, *garancine* is also obtained, a powder of madder, saturated with concentrated sulphuric acid. The Neapolitan provinces alone export madder annually to the amount of more than 1,200,000 ducats (£206,000).

Indigo is not cultivated in Italy; the trials made to cultivate the *Indigofera Anil*, and the dyeing blood wort (*renouée*) (*Polygonum tinctorium*), have nevertheless succeeded in some provinces, principally in Calabria, near Reggio, and in Sicily, but they have not been followed up, because the culture of these plants has been found to be much less profitable than that of wheat.

In order to obtain a blue colour, woad (*quado*, *Isatis tinctoria*, L.) is resorted to. This plant grows wild in some places, and the culture at the present day is almost abandoned, except here and there in the Neapolitan provinces and in Tuscany. Thirty years ago it was cultivated in the valley of the Tiber on as great a scale as it was profitable. A *stiero*, about two hectares of good land near the city of San Sepolcro, might yield an average of about five thousand cakes of woad, at the price of ten écus (£2 5s.) the thousand; a revenue of £11 5s. was therefore derived from this source. Prices declined to 295 livres the thousand; at present the price has again advanced, but the consumption of woad, and consequently its cultivation, are very restricted. Dyers use it to give to indigo a body and permanence.

Guadarella (*Chiarazza*, *Reseda luteola* L.) is particularly cultivated in the Neapolitan provinces and in the island of Capri to dye cloth a yellow colour; the *Reseda crispata*, which grows spontaneously in several places, is used in the province of Otranto to dye wool. In the Abruzzi and the Principalities, the flowers of the *Anthemis tinctoria* are especially used, and elsewhere the *Genista tinctoria*, &c. Saffron is also cultivated (*Crocus sativus*, L.) in the Tuscan Maremmas and in the south.

The safflower (*Zaffrone* or *Zafferanone*, *Carthamus tinctorius*) comes from the dried flowers of a compound plant, which is cultivated pretty largely in many places, as well as in the mountains.

Among the dyeing plants of Italy there is the sumac (*Scotano Rhus Cotinus*), which yields a beautiful yellow colour, and the archil, which is obtained from several species of lichens. Several qualities are extracted from the *Rocella tinctoria*, from the *Gyrophora urtulata*, &c., and are well known in commerce, particularly in the island of Sardinia and Pantellaria.

Acorns are in general very much neglected as a dyeing material; they are gathered in some places for use in tanning.

**1034.**—969.\* ARNAUDON, Prof.  
GIACOMO, Turin.

Collection of various tinctorial substances; madder, saffron, safflower, &c.

**1035.**—970.\* ASCOLI (SUB-COMMITTEE OF).

Guadarella.

**1036.**—881. AUGIAS, SALVATORE,  
Tempio.

Three qualities of archil.

**1037.**—889. BELLELLA, ENRICO,  
Capaccio (Salerno).

Madder of thirty months, called Pyto madder.

Eighteen and seven months' madder.

**1038.**—888. BELLELLA, GIOVANNI,  
Salerno.

Eighteen months' madder from the plain of Capaccio.

Two samples of madder of seven and thirty months.

**1039.**—899. CAGLIARI (SUB-COMMITTEE OF).

Saffron.

Sumac.

Madder.

**1040.**—980.\* CASERTA (SUB-COMMITTEE OF).

Safflower seed.

Madder root.

Madder seed.

**1041.**—904. CHERICI, NICCOLÒ,  
Borgo San Sepolcro (Arezzo).

Woad.

Various samples, coloured with the same.

**1042.**—907. D'ALESSIO, GENNARO,  
*Capaccio (Salerno).*

Thirty months' madder from Pesto.  
Madder, 2nd quality.

**1043.**—915. FROELICH, G. AND CO.,  
Madder.

Garancine, 1st quality.  
Do. 2nd quality.

**1044.**—919. GRANOZIO, DOMENICO,  
*Salerno.*

Thirty months' madder from the  
plain of Montecorvino, Rovella.

**1045.**—922. LORU, ANTICCO, *Cagliari.*

Lentiscus leaves.  
Saffron.  
Saffron root.

**1046.**—425. MARINI DEMURU,  
DOMENICO, *Cagliari.*

Saffron.

**1047.**—934. NAPLES (SUB-COM-  
MITTEE OF).

Madder.

**1048.**—938. PACIFICO, GIUSEPPE,  
*Salerno.*

Thirty months' madder from Sa-  
lerno.

**1049.**—939. PAGANELLI, EMILIO,  
*Castrocaro (Forlì).*

Safflower (*Carthamus tinctorius*).

**1050.**—947. PIÙ, FRANCESCO, *La-  
nusei (Cagliari).*

Madder.

**1051.**—955. SAGLIOCCA, GAE-  
TANO, *Pietralcina (Benevento).*

Natural madder root.

**1052.**—2247.\* SCOCCHERA, SA-  
VINO, *Canosa (Bari).*

Madder of 1861.

#### § 4. TANNING SUBSTANCES.

The bark of several trees, that of the pomegranate (*Punica Granatum*, L.), of the oak (*Quercus* sp.), of the cork tree (*Quercus Suber*, L.), gall nuts, as well as acorns, the leaves of the *Pistacia Lentiscus*, of the myrtle (*Myrtus communis*), and of the sumac (*Rhus Cotinus*, L.), are the substances chiefly employed in tanning skins. In some parts of Naples, in Sardinia, and particularly in Sicily, a great trade is carried on in sumac (*Rhus Coriaria*, L.), a small shrub growing spontaneously in the south of Italy, above all in Sicily, where there are few arid hills upon which the sumac is not cultivated. From its leaves a fine yellow powder, which is very rich in tannin, is obtained by grinding. In several parts of Sicily, at Palermo especially, bags of sumac are at all times to be seen piled up destined for shipment to various places, particularly the United States, where there is a large consumption. It is to the trade in sumac that several merchants in Sicily owe their large fortunes.

**1053.**—969.\* ARNAUDON, Prof.  
GIACOMO, *Turin.*

Collection of various tanning sub-  
stances, leaves, bark, &c.

**1054.**—898. BURGARELLA,  
AGOSTINO, *Trapani.*

Sumac.

**1055.**—910. FAVARA, VITO,  
*Trapani.*

Sumac leaves.

**1056.**—913. FIORELLI, GIUSEPPE,  
*Salo.*

Sumac leaves.

- 1057.**—989.\* GUIDI, CAMILLO, Volterra (*Pisa*).  
Myrtle leaves, called *Mortine*.
- 1058.**—988.\* GIUDICE, GASPARE, Girgenti.  
Powdered sumac.
- 1059.**—2258.\* FORCALLI, GIUSEPPE, Salò (*Brescia*).  
Sumac.
- 1060.**—925. MACERATA (SUB-COMMITTEE OF).  
Sumac leaves.
- 1061.**—928. MAJORANA, BROTHERS, Catania.  
Militello sumac.
- 1062.**—927. MAGGIORANA, FRANCESCO, Milan.  
Powdered sumac.
- 1063.**—2261.\* MUNAFÒ, GAETANO, Sicily.  
Sumac.
- 1064.**—936. NIEDDA DI S. MARGHERITA, Count PIETRO, Cagliari.  
Sumac.
- 1065.**—2242\*. REGGIO, CALABRIA (SUB-COMMITTEE OF).  
Sumac leaves and powder.
- 1066.**—926. MAFFEI, NICCOLÒ, Volterra (*Pisa*).  
Juniper berries.  
Myrtle and *Lentiscus* leaves.

### § 5.—TEXTILE SUBSTANCES.

The hemp of Bologna, of Ferrara, of Cesena, of Ascoli, and of Naples is highly esteemed, as is also the flax of the provinces of Cremona, of Lodi, of Brescia, in Lombardy, which is exported in large quantities, irrespective of the local consumption (which is very considerable) for making the highly-valued linens of Cremona and Lodi. At Salerno and in the Terra di Lavoro the cultivation of flax is of recent date. Although conducted on a considerable scale, no portion of its produce is exported, but is almost entirely absorbed by the great Industrial Parthenopean Association, the most important in Italy.

Italy produces many other textile fibres, but of less importance, derived from plants found wild, or which have become so. The aloes, for example (*Agave americana*), transplanted from the elevated districts of Mexico, a short time after the discovery of America, quickly spread in various parts of the Peninsula, particularly on the western coast, in all the islands, great and small, and even in the north, upon the banks of the lakes, where it serves to make hedges with its thick thorny leaves. It flourishes almost always in the south and on the coast, where it raises its shafts like great candelabra, growing to a height of from 20 to 24 feet. Its pith is used by naturalists as a substitute for cork, for fixing insects, &c., with pins; the fibres of the leaves are strong and tough; they are used blanched, or variously coloured, to make ladies' bonnets, and for artificial flowers, rope, bags, and different fabrics, particularly in Lecce, in Sardinia, and in the island of Elba.

The fibres of the Spanish broom, or common broom (*Spartium junceum*, L.), a very common plant on our hills and woods, are used sometimes to make coarse cloth, known in Tuscany under the name of *genestrino* cloth. Attempts have been made several times to utilise also the cortical fibres of the lupin. Those of the *Eparto* grass (*Lygeum Spartum*, L.), a small grass of the arid hills of the south, are used to make ropes and twine, especially in Sicily. The fibres of the marsh-mallow (*Althæa rosea*), of the *Hibiscus pentacarpos*, are less generally employed. Other fibres, altogether neglected, might be utilised, as the pine-apple, cultivated for its fruit, the leaves of which are thrown away, notwithstanding they have textile and very delicate fibres. But we cannot enumerate here all these respective diversified articles, from the want of exhibitors.

1067.—933. MUSICO, D., *Messina*,  
Aloe fibres.

Broom manufactured.  
Broom manufactured and combed.  
Broom tissue for bags.

1068.—917. GATTI, ALESSANDRO,  
*Cosenza*.  
Broom fibres.

1069.—942. PALUMBO, ORAZIO,  
*Trani (Bari)*.  
Asclepias, or vegetable silk.

Hemp and flax (upon the subject of which copious explanations will be given in Class xix.), will be registered amongst the productions of that class.

We are now about to speak of cotton, which on many accounts, especially at this moment, deserves attention.

### COTTON.

Cotton has been cultivated in Italy from remote ages. It appears to have been introduced in the ninth century, by the Saracens. As early as the eleventh century it formed one of the chief agricultural products of Sicily and of the banks of the Adriatic and Ionian Seas. According to Giovan Battista Della Porta, a writer of the sixteenth century, cotton must have been cultivated on a very extensive scale in Apulia (apud Apulos, ubi copiosissime seritur).

Documents exist at Bisceglia (Terra di Bari), of the year 1050, from which we learn that the priests of Adueno let their land for the cultivation of cotton (ad colendum gossypium). In the last century this cultivation extended towards the north as far as Sienna and Grosseto in Tuscany. During the continental blockade, and the war of the first empire, Italy furnished cotton to almost the whole of Europe; and the centre of this industry was in the environs of Naples, and this cotton was generally known in commerce under the name of Castellamare cotton.

Upon the restoration of peace the deplorable financial state of Italy did not enable her to compete with the low-priced cotton of America and the British Indies. Roads were not only wanting, but also a good system of irrigation and draining of the land. The cultivation of cotton was, in consequence, abandoned, except in a few localities, where the peasants were accustomed to spin their cotton by hand, for making stockings, counterpanes, and coarse cloths, in the fashion of the country.

In later years the cultivation of cotton in Italy has been resumed to a certain extent, thanks to the introduction of cotton spinning by machinery.

The Royal Italian Commission, strongly impressed with the great importance which this branch of culture possesses for Italy, has endeavoured to form a complete collection of specimens of the cotton at present produced in the different provinces of the kingdom.

There are two sorts of cotton in Italy, the common white cotton (*Gossypium herbaceum*, Lin.), and Siamese cotton (*Gossypium siamense*, Ten.).

The common white cotton is cultivated in several localities on the shores of the Mediterranean. Its fibre is of inferior quality, and somewhat greyish. It is only used for common manufactures.\* A white and very strong fibre (*land albo-nivea*, Ten.) is the cotton of Castellamare, of which we have just spoken; the other variety produces a yellow brownish fibre (*lana rufa*, Ten.). This species is an annual in Italy, although it is asserted that it has been perennial in Calabria.†

\* The plant of the common white cotton is usually from 10 to 12 inches in length. It has fusiform roots of 4 inches in length; straight, cylindrical and woody stalk, somewhat reddish, and often spotted with black; separating into two alternate branches, and taking the form of a pyramid; leaves of a pale green colour, and very piliat, having five oval, rounded lobes, with a little point at the top; the mid-rib has a gland; petiole being an inch and a-half or two inches in length, covered with small black thorns, and provided with two lanceolate and curved stipules; flowers springing from the axilles of the leaves, supported on peduncles shorter than the petioles; double calyx, the outer, the largest, formed by three segments almost cordiform, deeply denated, often crested; inner calyx provided with five small teeth; corolla campanulated, with five yellow petals, and a claw spotted purplish red; the dry petals acquire a red uniform tint; numerous stamens which surround the pistil, divided into 3 or 4 stigmata; the fruit is an oval capsule, of the size of a hazel nut, with three or four carpels, which open into as many valves; the seeds are almost globular, of the size of a chick pea, enclosed in a covering of greyish white cotton; after the cotton has been ginned the seeds retain a greyish down.

† Siamese cotton has a fusiform brownish root, of about 8 to 8½ inches in length; stalk straight and cylindrical, much larger than that of the common white cotton, growing to 17 or 18 inches, often bristling with thick hair, of which one portion is in the form of stars, the others are simple and longer; branches alternate, pyramid shape; leaves of a brownish green, with three or four deep tapering lobes, the two exteriors of which are deeply cordiform, the leaves being throughout undulated, rough above, hairy beneath, and covered with little black prickles, especially in the nerves; the mid-rib has a gland one-third of its length; petiole

It would be difficult to decide which description of cotton was first introduced into Italy, although, by what Della Porta has written, the Siamese cotton has been known there for several centuries.

Several attempts to introduce Pernambuco cotton (*G. vitifolium*, Wild) into Naples have been made, but the winters there were too severe. Other attempts for the acclimatization of the arborescent cotton (*G. arboreum*, Linn.), already cultivated in Spain, have failed at Lecce. Although the plant fructified every year, it suffered in winter.

The proper zone for the cultivation of cotton in Italy is very extensive. Besides the islands of Sicily and Sardinia, it embraces the continent from the southern extremity up to the Valley of the Tronto on the shores of the Adriatic, lat. 43° N., and upon the Mediterranean it extends still further towards the north. The southern and eastern slopes, which do not exceed three hundred feet above the level of the sea, are the best adapted for its cultivation.

Cotton is cultivated in Italy, with or without irrigation; and at those periods when the price is very high it is grown even on the arid sides of Mount Vesuvius. Before, however, we think of producing a large quantity of cotton, we must seriously set to work to improve the system of drainage and irrigation in the south, which is the only thing wanting to make cotton one of the chief products of Italian agriculture, without encroaching in any way upon the present range of cultivation. The country upon the shores of the Ionian Sea, formerly Magna Grecia, is at the present time altogether depopulated, and farmers cannot settle there from want of a supply of water, to which no attention has been paid since the epoch of the first civilisation of Italy.

Generally, it may be said that the quantity of cotton produced in a hectare in Italy is from 250 to 600 kilogrammes, but the improvements which might be easily introduced into our agricultural systems would greatly augment the production, which now, even in the provinces where it is most cultivated, can only be deemed insignificant amongst the other revenues of the soil. Thus, in the province of Terra di Otranto it does not exceed 700,000 to 800,000 kilogrammes, and about 140,000 kilos. in the province of Terri di Bari.

South Carolina, with a population of 715,000 souls, produces 500,000 bales of cotton. In Italy there are more than 8,000 square kilometres, perhaps more than 800,000 hectares of land suitable for cotton cultivation; and if only one-third of it were planted with cotton, it would produce at least one million of kilogrammes, or 550,000 bales of cotton. There are not wanting hands to commence immediately an extensive cultivation of the plant; and its cultivation in Italy upon a large scale might have a happy influence upon the prosperity of the country, and add a considerable contingent to the cotton industry of the world.

## CATALOGUE

### OF THE COLLECTION OF COTTON MADE BY THE ROYAL ITALIAN COMMISSION.

The different specimens of this collection were examined, on the 13th June and the following days, by Mr. Wanklyn, of Bury, deputed by the Cotton Supply Association of Manchester. The observations, as well as the valuation, have been furnished by Mr. W. Wanklyn. The various specimens are from individual exhibitors hereafter registered.

#### PROVINCE OF ASCOLI.

**1070.**—932. **MOZZANO** (MUNICIPALITY OF).

Cotton seed.

#### PROVINCE OF CAGLIARI.

**1071.**—899. **CAGLIARI** (SUB-COMMITTEE OF).

1. White Siamese cotton (*Gossypium Siamense*); cultivated at Bari; very good; 13d. per pound.
2. Tawny Siamese cotton (*G. Siamense*, Ten.).
3. Common white cotton (*G. herbaceum*); better fibre than No. 1, but the colour is inferior; 12d. per lb.

red and pubescent; flowers on the axils of the leaves, single or double; peduncles pubescent, of a reddish brown, at first shorter, but afterwards longer, than the petiole; corolla two or three times larger than the outer calyx, which has five cordiform lobes, crested, and persistent; the inner calyx is gamosepalous, with five obtuse lobes; petals sometimes folded, of a yellow colour, changing to a red before they fall; stamens monadelphous, varying in length from one-fourth to three-fourths of an inch; capsules oval, of about an inch and a-half in length, with a prominent point, opening when ripe into four divisions, formed of as many cells, filled with snowy white cotton fibre; seeds oval, enveloped in a greenish down, very adherent, six or eight in a cell, disposed in double rows around the axis of the capsule.

## PROVINCE OF CALABRIA CITERIORE.

**1072.**—886. BARTOLINI, CARLO, *Cosenza*.

1. Tawny Siamese cotton, cultivated at Rossano.
2. White Siamese cotton, cultivated at Corigliano; very good; 12d. to 13d. per lb.
3. White Siamese cotton, cultivated at Roseto; very strong staple; 10d. to 11d. per lb.
4. White Siamese cotton, cultivated at Rossano; good staple; not well ginned; 11d. per lb.
5. White Siamese cotton, cultivated at Rocca Imperiale; very good; 12d. to 13d. per lb.

**1073.**—999. PACE, VINCENZO, *Castrovillari*.

1. White Siamese cotton.
2. Do. do. with seeds.
3. Tawny Siamese cotton.
4. Do. do. with seeds.
- \*5. No. 2, cleaned at the Exhibition with Platt's gin; white, silky, strong, and regular fibre; 13d. to 14d. per lb.

## PROVINCE OF CALABRIA ULTERIORE II.

**1074.**—981. CATANZARO (SUB-COMMITTEE OF).

1. White Siamese cotton, cultivated at Briatico. Good staple, but bad colour; having been spoilt in ginning, the sample is only worth 8d. per lb.; well prepared it would be worth 12d. Fibre irregular.
2. Seeds of the same.
3. White Siamese cotton, cultivated at Tropea. Good useful cotton, but of rather coarse fibre. Badly ginned; worth 10d. to 11d. per lb., whilst if it had been well ginned it would have been worth 11d. to 12d.

4. Seeds of the same.

7. Common white cotton, cultivated at Badolato. Coarse, inferior quality; badly ginned; 9d. to 10d. per lb.; well ginned it would be worth 10d. to 11.

8. Seeds of the same.

9. White Siamese cotton, cultivated at Badolato. Good and useful cotton; would sell very well at 11½d. to 12d. per lb.

10. Seeds of the same.

11. Tawny Siamese cotton, cultivated at Briatico.

12. Seeds of the same.

13. Tawny Siamese cotton, cultivated at Badolato.

14. Seeds of the same.

15. Tawny Siamese cotton, cultivated at Tropea.

## PROVINCE OF CALTANISSETTA.

**1075.**—2268.A\* DILGH, EDOARDO AND Co., *Catania*.

1. Common white cotton, cultivated at Terranuova; spoiled in ginning; 8d. to 9d. per lb.; well prepared it would be worth 12d. to 13d.

2. Seeds of the same.

**1076.**—928A. MAJORANA, BROTHERS, Baron of Nicorra, *Catania*.

1. White Siamese cotton, cultivated at Terranuova, exceedingly good; value 13d. per lb.

2. Common white cotton, cultivated at Terranuova, exceedingly good; value 13d. per lb.

\*3. Tawny Siamese cotton, cultivated at Santa Maria di Nisemi.

4. Tawny Siamese cotton, cultivated at Terranuova.

## PROVINCE OF CAPITANATA.

**1077.**—984. FOGGIA (SUB-COMMITTEE OF).

1. White Siamese cotton, strong, but coarse and harsh; it cannot be recommended; value 9d. to 10d. per lb.
2. Common white cotton, very short, spoiled in ginning; well ginned it would be worth 11d. per lb.
3. Tawny Siamese cotton.

PROVINCE OF CATANIA.

**1078.**—976. **BIANCAVILLA** (MUNICIPALITY OF).

1. White Siamese cotton, cultivated at Biancavilla. Very superior quality, would be worth 1s. 5d. per lb. The sample exhibited, having been badly ginned, is not worth more than 11d.
2. Do. with seed.

**1079.**—978. **BISCARI** (PRINCE OF *Catania*).

1. White Siamese cotton with seed, cultivated at Paternò. Very good and silky; cleaned it would be worth 14d. per lb.
- \*2. Do. cultivated at Aragona, territory of Adermò. Fine cotton, equal to fair Uplands, 13½d. to 14½d. per lb.
- \*3. The same, No. 1, cleaned at the Exhibition by Platt's gin. Good, silky, white. Fibre equal to that of good New Orleans, 14d. per lb.

**1080.**—2267.\* **CATANIA** (MUNICIPALITY OF)

White Siamese cotton. Very good and useful.

**1081.**—2268b.\* **DILGH** (EDOARDO AND Co.), *Catania*.

1. White Siamese cotton, cultivated at Biancavilla. Beautiful cotton, but spoilt in the ginning; otherwise it would have been worth at least 13d. per lb.
2. Seeds of the same.

**1082.**—928. **MAJORANA**, BROTHES, Barons of Nicorra, *Catania*.

1. Tawny Siamese cotton, cultivated at Biancavilla.
2. White Siamese cotton, cultivated between Biancavilla and Paternò. Of fine colour and well cleaned, but weak staple; 12d. per lb.
3. Tawny Siamese cotton, of the same locality.
- \*4. Tawny Siamese cotton.

**1083.**—2266\*. **PATERNÒ** (MUNICIPALITY OF).

1. White Siamese cotton, of fine colour, very clean, but with fibre irregular and weak, the cause of which is not clear; value, 10½d. to 11d. per lb. If the fibres had been regular it would have been worth 13½d. to 14d. per lb.
2. White cotton, equal to fair Uplands.
3. Tawny cotton.
4. Tawny cotton.

**1084.**—2253. **UGO**, GIUSEPPE, Marquis delle Favara, *Palermo*.

1. White Siamese cotton, cultivated at Scirfi di Biancavilla, 13d. to 14d. per lb. Very good, and well ginned.
2. Do. cultivated at Saitta di Biancavilla; very good and well cleaned, 13d. to 14d. per lb.
3. The same with the seeds.
4. Common white cotton, cultivated at Saitta di Biancavilla with seeds. Good quality.
- \*5. No. 3, cleaned at the Exhibition by Platt's gin; strong, coarse fibre; white, useful cotton.
- \*6. The same as No. 4, ginned at the Exhibition by Platt's gin. Mixed red and white, badly harvested; value 10d. per lb.; well-harvested and all white, it would be worth 13½d. per lb.

- \*7. The same as No. 3, cleaned at the Exhibition with Platt's gin. Good cotton, equal to good middling American Upland. Value 13½d.

PROVINCE OF GIRGENTI.

**1085.—987. GIRGENTI (SUB-MITTEE OF).**

1. White Siamese cotton, cultivated at Licata. Not very good, weak fibre, 10d. per lb.
2. White Siamese cotton, with seeds, cultivated at Favara.
3. Common white cotton, cultivated at Sciacca. Beautiful cotton and of fine colour, but entirely spoilt in the ginning; value of the sample 8d. to 9d. per lb. Well ginned it would be worth 12d. to 13d.
- \*4. The same as No. 1, cleaned at the Exhibition with Platt's gin; very short coarse fibre; 10d. per lb.
- \*5. The same as No. 2, cleaned at the Exhibition with Platt's gin; good useful cotton; colour not very good.

**1086.—992. LICATA (MUNICIPALITY OF).**

1. Common white cotton, beautiful and of fine colour, but completely spoilt in the cleaning; value of the sample 8d. to 9d.; well prepared, it would have been worth 12d. to 13d. per lb.

**1087.—994. MENFI (MUNICIPALITY OF).**

1. Common white cotton.
2. Seeds of the same.
3. Siamese Tawny cotton, with grain.
- \*4. The same as No. 1, cleaned at the Exhibition with Platt's gin; fibre overgrown, coarse, and weak; value 10d. to 11d. per lb.

**1088.—995. MONTALLEGRO (MUNICIPALITY OF).**

1. Common white cotton, badly ginned; value of the sample 8d. per lb.; well cleaned it would have been worth 10d.
2. Do., with seeds.
- \*3. The same as No. 2, cleaned at the Exhibition with Platt's gin; cotton of inferior quality, white fibre, but short and coarse, mossy; 9d. to 10d. per lb.

**1089.—2244. SCIACCA (MUNICIPALITY OF).**

Common white cotton.

**1090.—2247. SICULIANA (MUNICIPALITY OF).**

Common white cotton, fibre short and coarse; average quality, 9d. to 10d. per lb.

PROVINCE OF MESSINA.

**1091.—2251. TAORMINA (MUNICIPALITY OF).**

White Siamese cotton.

PROVINCE OF NAPLES.

**1092.—934. NAPLES (SUB-COMMITTEE OF).**

1. White Siamese cotton of 1st quality, beautiful, and of good colour, but spoilt in ginning, consequently, irregular; value of the sample 10d. per lb.; well cleaned it would have been worth 13d.
2. Seeds of the same.
3. White Siamese cotton, 2nd quality; 8d. per lb.
4. Seeds of the same.
5. Dry plant of white Siamese cotton.

6. White Siamese cotton, cultivated at Torre Annunziata; superior quality; value 13d. to 14d. per lb.
7. Seeds of the same.

**1093.**—967. VONWILLER, D. AND Co., *Naples*.

1. White Siamese cotton. Beautiful cotton, well prepared; value 12d. to 13d. per lb.
2. The same, with seed.
3. Collection of cotton yarn made from the above, and other samples of spun foreign cotton, to serve for comparison.
- \*4. The same as No. 1, ginned at the Exhibition by Platt's gin; good, white, and silky staple, equal to good New Orleans: worth perhaps more than 14d.

PROVINCE OF NOTO.

**1094.**—991. LIBRA, FRANCESCO *Catania*.

White cotton from Pedoggi; very good, but spoilt in the cleaning. Value of the sample 8d.; well prepared it would be worth 13d. per lb.

**1095.**—928c. MAJORANA, BROTHERS, Barons of Nicorra, *Catania*.

1. White Siamese cotton, cultivated at Dorillo, near Comiso; very superior quality, and well prepared; staple very regular; 13d. to 14d. per lb.
- 1 *bis*. The same, with the seeds.
2. Another sample with seed, cultivated at Dorillo.
3. Common white cotton, cultivated at Pachino; good and useful, but not well prepared. The sample is not worth more than 11d. per lb.; well ginned it would have been worth 12d. to 13d. per lb.
4. Common white cotton, cultivated at Troldo, good, but of irregular fibre; value 11d. to 12d. per lb.

5. Common white cotton, with seed, cultivated at Terranuova di Comiso.

6. Tawny Siamese cotton, cultivated at Pachino.

6. *bis. & ter.* Two samples of seeds of No. 6.

7. Common white cotton, with seeds, cultivated at Terranuova di Comiso; second class cotton, spoilt in ginning; value of the samples, 9d. to 10d. per lb.; well prepared, 11d. to 12.

- 7 *bis.\** Sample of No. 7, cleaned at the Exhibition with Platt's gin; value 12½d. per lb.

- 7 *ter.* Seeds of No. 7.

8. Tawny Siamese cotton, with seed, cultivated at Comiso.

9. Tawny Siamese cotton, cultivated at Dorillo.

10. The same as No. 9, but with seeds.

11. Tawny Siamese cotton, cultivated at Comiso.

12. Seeds of white Siamese cotton, cultivated at Terranuova di Comiso.

13. Seeds of white Siamese cotton, cultivated at Pachino.

14. Another sample of No. 13.

15. Seeds of common white cotton, cultivated at Dorillo, near Comiso.

16. Seeds of tawny Siamese cotton, cultivated at Terranuova di Comiso.

17. Another sample of No. 16.

18. Tawny cotton cultivated at Troldo.

**1096.**—2249. SINASTRA, CONRADINO, *Noto*.

1. White Siamese cotton, with seeds; good. Without seeds it would be worth about 12d.
2. White Siamese cotton of 1st quality; value 12d. per lb.
3. Tawny Siamese cotton, with seeds.

\*4. The same as No. 2, cleaned at the Exhibition with Platt's gin. Beautiful white cotton; value, 13d. to 14d. per lb.

\*5. The same as No. 1, cleaned at the Exhibition with Platt's gin. Good, silky, white, strong fibre of average length, 12d. to 12½d. per lb.

PROVINCE OF THE CITERIORE PRINCIPALITY.

1097.—919. GRANOZIO, DONENICO, *Salerno*.

1. White cotton, cultivated at Monte Corvino. Average quality, 11d. to 11½d. per lb.
2. Another sample.

1098.—2245. SALERNO (SUB-COMMITTEE OF).

1. White Siamese cotton; good cotton, but badly prepared. Value 10d. to 10½d. per lb. Well prepared it would be worth 12d..
2. The same, with seed.
3. White cotton in the pod.

PROVINCE OF TERRA DI BARI.

1099.—891. BELTRANI, GIUSEPPE, *Trani*.

1. White cotton of first quality.
2. White cotton of second quality.
3. Tawny Siamese cotton.

1100.—979. CANOSA (MUNICIPALITY OF).

Common white cotton, overgrown, and consequently of bad colour. Value 9d. per lb.

1101.—2247.\* SCOCCHERA, SAVINO, *Canosa*.

1. Common white cotton. Good, but too ripe, and badly ginned. Value of the sample 11d. per lb.; well cleaned it would be worth 12d.
2. Seed of No. 1.
3. Another sample of the same.

PROVINCE OF TERRA D'OTRANTO.

1102.—977. BRINDISI (SUB-COMMITTEE OF).

1. White Siamese cotton, 1st quality. Spoilt in the cleaning. Value of the sample, under 8d. per lb.; in good condition it would be worth 11d. to 12d.

PROVINCE OF TRAPANI.

1103.—910. FAVARA - VERDIRAME, *Vito (Trapani)*.

1. White Siamese cotton. Good and of beautiful colour, badly cleaned. Value of the sample, 9d. to 10d. per lb.; well ginned it would be worth 12d. to 13d.
- \*1 bis. Another sample, better cleaned; 11d. to 12d. per lb.
2. Tawny Siamese cotton.
- 3-4. Seeds of Nos. 1 and 2.
5. White Siamese cotton. Good; 13d. per lb.
6. Another sample of the same. Good cotton, but badly cleaned. Value of the sample 10d. to 11d. per lb.; well prepared it would be worth 12d. to 13d.
7. Another sample of Tawny cotton.
8. Seeds of Siamese cotton.

1104.—993\*. MAZZARA (MUNICIPALITY OF).

Cotton seeds.

## § 6. TIMBER SUITABLE FOR BUILDING PURPOSES, CABINET MAKERS, BARK, &c.

In the coldest regions of Italy the Birch tree (*Betula alba*, L.), the Scotch Fir (*Pinus sylvestris*, L.), the Norway Spruce (*Abies excelsa*, Dec.), the Silver Fir (*Abies pectinata*, Dec.), the Larch (*Larix Europæa*, Dec.), and many other species of trees, form vast forests on the slopes of the Alps and in parts of the Apennines, yielding excellent timber for the construction of ships and buildings, for making wooden bridges, and other uses. Along the Apennines, and particularly in the Casentino, M. Carlo Siemoni has planted several millions of firs and larch trees—a noble attempt, worthy of being followed, to re-timber the mountainous districts. The Walnut (*Juglans regia*, L.) and the Chestnut tree (*Castanea vesca*, L.), with their thick foliage, form noble forests; and the walnut, superior to the chestnut for the beauty of its wood, is very much used by furniture makers. The beech tree (*Fagus sylvatica*, L.), the oak (*Quercus pedunculata*, Ehr., *Sessiliflora*, Ehr., *Cerris*, L., the Holm oak (*Quercus Ilex*, L.) and fifteen to eighteen sorts of particular oaks in the southern provinces and in Sicily, a number of shrubs, particularly of heaths (*Erica arborea*), of *Cistus* (*Cistus*, Sp.), furnish an abundance of wood for fuel, for building, charcoal, bark, &c.

A complete treatise might be written upon woods, whether for building purposes or fuel, and upon the very important revenues which are derived from this portion of the earth's products, whether from forests or from trees which grow in cultivated spots, and upon the methods, good and bad, connected with the timber trade, happily not fettered by too many regulations, but rather perhaps left too much to arbitrary rules. The production of timber is estimated at 20,000,000 cubic metres.

In every country which does not produce coals, charcoal adds considerably to the revenue derived from forests. Being comparatively light, it is transported with but little difficulty to distant localities, over even bad roads, and thus furnishes, at a cheap rate, the means of keeping up fires for domestic and other purposes. There are different kinds of charcoal, such as that from the chestnut, the beech, the oak, and others, distinguishable by their being hard or soft, their heating properties, and their slow or rapid combustibility. Charcoal is still prepared in the middle of forests, by the process so long in use by charcoal-burners, that is, in large heaps, and necessarily with considerable waste.

Besides the large charcoal produced from the trunks of trees, there is a small coal, made from the branches and young trees. The small coal is used generally for domestic purposes. Charcoal made from oak is stronger, and possesses greater heating powers than many other kinds, and is therefore especially selected for forge work and for the reduction of minerals; it is used in the iron-works of Lombardy, and in the lead-works of Sardinia, where, however, every other description of coal is also used.

The beech (*Fagus sylvatica*, L.) is of importance in the elevated regions where it grows, because its wood is easy to split in straight pieces, and for that reason it is used for the manufacture of all kinds of articles not requiring thickness, such as cheese-moulds, small boxes, &c., and is much employed in the making of agricultural implements, in country cottages, and in various manufactures. Moreover its wood and the charcoal made from it, furnish a light fuel, admirably suited to burn in dwelling-houses; the kernel of the beech-tree fruit yields an oil, which however is not much used.

The chestnut, so valuable for its fruit, yields a timber which well resists the effects of weather; above all, it is a wood well fitted and in much request for making tubs and wine-casks, and the pieces left after forming the staves are suitable for making barrel-hoops and vine props.

Oak is pre-eminently the timber best adapted for ship-building; the pine is well suited for piles in the making of bridges, &c., and for ships' masts, for planking, and for all kinds of large furniture, for which deal and larch are still better adapted.

The cork-tree (*Quercus Suber*, L.), very general in some parts of the southern country, furnishes cork; the best quality, however, and that most esteemed, comes from Sardinia and Tuscany. It contributes to the wants of navigation and of fisheries, is applied to many economical uses, and furnishes corks for bottles. Genoa and Leghorn consume so large a quantity in their manufactories of cork, that the cork-tree not being equal to their demands, the cork-cutters are obliged to stop work and keep holiday. The landowners neglecting to bark the trees every five or six years, and carry it away, it remains too long on the trees, and becomes too large and mouldy. If due care were taken in this respect, the cultivation of the cork-tree would be improved, and we might be able to send corks to France and other countries, instead of being under the necessity of importing them.

In the region of the Mediterranean, and in the islands, the best woods for cabinet work are the alatern (*Rhamnus Alaternus*, L.), the carob tree (*Ceratonia siliqua*, L.), and the olive, which grows in a wild state, and which often grows to a large size; as also the orange tree (*Citrus Aurantium*, L.), which is cultivated in forests. The woods of these trees are esteemed

on account of their agreeable tints and their beautiful grain, and are greatly in request by cabinet makers; boxes are made of them, and also very pretty articles of furniture, particularly in Sicily.

The box (*Buxus sempervirens*, L.) is useful to turners and engravers. The cypress wood (*Cupressus sempervirens*, L.) is still more useful; this tree, which is almost confined to the cemeteries of Naples and Sicily, has been cultivated from time immemorial in Tuscany and in all the middle provinces, on account of the lasting qualities of its wood, which is in great demand for the making of railings, and also for boxes in which to keep wool and fur during the summer, &c. The cultivation of this resinous plant, which succeeds pretty well in places which are not too cold in winter time, possesses, amongst other advantages, that of covering naked and barren hills with vegetation.

Acorns are used as food for pigs.

We have already spoken of walnuts and other nuts from which oil is made. The carobba, or sweet fruit of the *Ceratonia siliqua*, L., is baked in ovens, and eaten in Sicily; it is also given as fodder to animals. The arbutus berries, the fruit of the *Arbutus Unedo*, L., resembling the strawberry in its form and colour, but having less scent, are either eaten, or used in making a spirit, from which spirits of wine have been produced since the vine disease.

The stone pine (*Pinus Pinea*, L.) is commonly cultivated in Tuscany for its kernels, which are eaten; and from which an oil is made, not less than for its wood and its bark. It is a tree which thrives in warm and southern countries; it is beautiful to look at, on account of its branches, which grow in the shape of a parasol, and is of remarkable beauty in the forests of Pisa and Ravenna.

The seeds of the *Celtis australis*, L., are eaten in Sicily and other places; the berries of the juniper (*Juniperus communis*, L.), are collected and used in the distillation of gin; those of the mistletoe (*Viscum europæum*, L.), and the *Loranthus europæus*, which are parasites of the pear, apple, service, oak and other trees, yield birdlime, an article of importance in some localities.

**1105.—971.\* AVELLINO** (SUB-COMMITTEE OF)

Collection of building timber.

**1106.—833. AYMERIC, IGNAZIO, Cagliari.**

Cork bark.  
Holm oak bark.  
Beech bark.

**1107.—971 bis. BARBA-TROYSE, VINCENZO, Foggia.**

Aleppo pine.  
Oak.  
Beech.  
Ash.  
Yew.  
Maple.  
Hornbeam.  
Linden-tree.  
Poplar.  
Holly.  
Judas-tree.  
Wild pear.  
Wild apple.  
Willow.  
Arbutus.

Medlar.  
Juniper.  
Pistachio.  
Lentiscus root.

**1108.—890. BELTRAMI, Count PIETRO, Cagliari.**

Charcoal of many qualities.  
Various woods, from the Isle of Sardinia.  
Cork bark, from Nuoro.  
Do. from Tempio Sostari.  
Do. of various trees, from Cagliari.

**1109.—276 bis. BRANDE, STANISLAO, Laconi (Cagliari).**

Bark of cork tree.  
Do. holm oak.  
Do. beech.

**1110.—982\* CAMPOBASSO** (SUB-COMMITTEE OF).

Various woods, oak, &c.

**1111.—900. CALANDRINI, Prof.**  
FILIPPO, *Florence.*

Xylological collection of 187 samples, corresponding to 187 species of plant, indigenous or cultivated in Tuscany.

**1112.—958. CETTI, GIUSEPPE,**  
*Sondrio.*

Xylological collection of 32 samples of plants of the Valtellina, with descriptive table.

**1113.—904. CHERICI, NICCOLÒ,**  
*Borgo San Sepolcro (Arezzo)*

Samples of building wood.  
Wood.

Amadon, or German tinder (*Boletus ignarius*).

**1114.—905. CREMONA (SUB-COM-**  
MITTEE OF).

Samples of woods, wild and cultivated, in the province of Cremona, for the use of cabinet-makers.

**1115.—925.\* MACERATA (SUB-**  
COMMITTEE OF).

Collection of woods.

**1116.—926. MAFFEI, Cav., Volterra.**

Collection of woods from the province of Volterra.

**1117.—928.\* MAJORANA, BRO-**  
THERS, *Catania.*

Oak timber.  
Holm-oak timber.  
Beech timber.

**1118.—929. MARATTI, Benevento.**

Collection of building woods from the province of Benevento.

**1119.—931. MODENA (COMMITTEE**  
OF).

Xylological collection of the woods of the province.

Samples of beech charcoal, of oak, and soft wood.

Bark for tanning.

Fruit (faggiole) of the beech-tree, *Fagus sylvaticus*.

Misseltree of *Loranthus europæus*.

Root of *Chrysopogon Gryllus*, for brooms and brushes, employed in the province of Modena (Carpi).

Sample of willow wood (*Salix alba*) for the manufacture of hats, called truciolo (chip).

**1120.—935. NAPLES (ROYAL**  
FOUNDRY OF).

Collection of woods of Southern Italy.

**1121.—998.\* ORTONA (MUNICI-**  
PALITY OF), *Chieti.*

Oak bark for building.

**1122.—946. PICCALUGA, GIU-**  
SEPPE, *Cagliari.*

Collection of woods of exotic plants, acclimatized in the environs of Cagliari.

**1123.—2263.\* PICCHI, PIETRO,**  
*Livorno.*

Bark and corks of cork tree.

**1124.—949. RAMO, STANISLAO,**  
*Laconi (Cagliari).*

Cork bark.

**1125.—948. RAVENNA (SUB-COM-**  
MITTEE OF).

Various products, barks, woods, fruits, &c., of the pines of Ravenna.

**1126.—2241. REGGIO (AGRICULTURAL COMMISSION OF).**

Building timber.

Oak bark (*Cerro Quercus Cerris*, L.).Do. (*Q. pedunculata*, Ehr.).**1127.—2246.\* SAVONA (LOCAL EXHIBITORS' COMMITTEE).**

Collection of woods.

**1128.—2264.\* SEMMOLA, FRANCESCO, Naples.**

Collection of woods.

**1129.—2114. SPANO, LUIGI, Oristano (Cagliari).**

Hard and soft wood charcoal.

**1130.—962. TIMON, ANTONIO, Cagliari.**

Collection of woods of the Isle of Sardinia.

**1131.—964. VARSÌ, GIROLANO, Cagliari.**

Cork.

For Charcoals, see Class I., Nos. 23, 79.

For Barks, see Class IV., page 167.

**§ 7. PLANTS FOR VARIOUS INDUSTRIAL PURPOSES.**

In the manufacture of the better kinds of paper, rags are used in Italy, as elsewhere, but the bark of the mulberry, wheaten straw, &c., are utilised for the inferior qualities. At Syracuse, from the papyrus of Syria (*Cyperus syriacus*, Parl.), which has become wild since the sixteenth century, paper is manufactured, in the same way as that which was made in Egypt with the *Cyperus Papyrus*, L., that is, by cutting the triangular stalks into longitudinal bands, and in weaving them with others placed transversely, as in weaving mats, and in making them adhere together under a press, by means of their natural gum. Upon this paper—an object of curiosity rather than of industry—the coloured form of the papyrus plant may be seen.

The sugar cane (*Saccharum officinarum*, L.), acclimatised in Sicily by the Arabians, was, during the sixteenth and seventeenth centuries, an article of such important culture as to yield a revenue equal to that of wheat. At that time there were many manufactories of sugar, which were called *trappeti*. Sugar was then an article for exportation as well as for home consumption; but the competition of America, and the quantity of wood which the sugar-makers consumed as fuel under the old processes, led to a decline in the cultivation of the cane, and in the last century it was entirely abandoned. In 1823 M. Gaspare Vaccaro made an unsuccessful attempt to re-establish it, by his work (*Richiamo della canna zuccherina in Sicilia*). The sugar cane is not now cultivated in Sicily, excepting near Avola, where they manufacture rum.

The small quantity of beetroot grown in Italy is not cultivated with a view to the manufacture of sugar, and it is, therefore, classed with plants used as fodder.

We have referred elsewhere to liquorice and sorgho sugars. See Classes II. and III.

Amongst the plants used in great industrial works, none surpasses wheat in importance, the straw of which is used to make bonnets. The wheat applied to this purpose is a summer variety of the *Triticum hybernum*, cultivated expressly in Tuscany, in poor, arid, and stony soils, in order that the stalks may be as thin as possible. They are gathered by rooting out the plant altogether. These are dried and blanched by gentle watering; the upper portion is then cut off, and arranged in different sizes, and blanched with sulphur, &c. Thousands of women and men gain their livelihood by plaiting the straw thus prepared, and in making what are called Tuscan or Leghorn bonnets, from which port they are exported. Besides bonnets, the straw is made into many articles—cigar-cases, &c., and feathers and other ornaments for females—and it combines the qualities of chenille, horsehair, and aloes. Bonnets, at a more moderate price than those of wheaten straw, are made of barley straw, but, not being so durable, they are less esteemed, although they are of finer texture, and have a larger number of turns in a given width, which constitutes the standard of fineness. The trade represented by bonnet-making and other articles from straw, whether for home or for exportation, is a source of wealth of a fluctuating character, depending upon fashion, but it has yielded as much as £160,000 to £200,000 (Serristori).

Willows (*Salix alba*, L.) are used in the manufacture of the celebrated chip hats (cappelli di truciolo); and at Chiavari, the seats of chairs are made of them. The willow is generally cut into longitudinal strips by a machine, but sometimes by hand, with a common knife; these

strips, from the thirty-second to the eighth of an inch in width, are plaited by the fingers, and then bleached, shaped, and rounded; they are woven, and, without sewing, are joined by a double turn. The good quality, the lightness, and the solidity of the chairs of Chiavari are well known, and a large trade in them is carried on, both in Italy and foreign parts. With the large branches of the willow, wine-props are made; and osier bands and reeds form various articles of basket work. In Tuscany, the large flasks and demi-johns are covered with the leaves of rushes, *Typha*, *Spartanium*, *Scirpus*, *Cyperus*, &c.

In Emilia, and particularly at Reggio, an important business is carried on in the manufacture of common brushes from the roots of the *Chrysopogon Gryllus*, a plant which grows on the edges of fields and ditches.

In Tuscany, for brooms they make use of the ear of the sorgho, (*Saggina da granata*, *Sorghum saccharatum*), whilst in Sicily the brooms are made of the dry leaves of the dwarf palm, bent and dried in bunches. This species of palm, the only one that is found in a wild state in Europe, grows on the hills and in the maritime parts of Sicily, on the western coast of Italy, and in Sardinia. It is an article of great trade amongst the Sicilians, who, with the leaves make hats, baskets, mats, rope, stuffing for chairs, &c.

Reeds (*Donax arundinaceus*, Beauv.), are in Italy of great use. The banks of rivers and the ditches are covered with them; they are used in agriculture, in the making of mats, trellis, reeds, pipes, &c. The spike of the marshy reed (*Phragmites communis*, Trin.), a very abundant plant, makes soft brushes for cleaning utensils. The spike of the *Dipsacus fullonum*, L., makes teazles, now generally superseded by metallic carding. From the asphodel (*Asphodelus ramosus*, L.), which grows in great quantities on the western coast and in the south of Italy, and which, by the exhaustive nature of its tuberous roots inflicts great damage upon agriculture, attempts have been made to extract alcohol.

In Sicily, the *Baccici*, otherwise called *dolcichini*, are cultivated. These are the sweet tubercles of the *Cyperus esculentus*, L., from which invigorating emulsions are prepared. The root of the *Scorzonera deliciosa*, Guss., a plant very common in the hills of that island, is much used in the making of ices. The *Zostera oceanica*, a kind of seaweed, is used to pack glass, porcelain, &c. The Iceland moss, very common in the mountains, is gathered for pharmaceutical purposes. The *lingua di faggio*, a sort of mushroom (*Boletus ignarius*), is collected to be converted into tinder. The bark of the *Daphne Gnidium*, L., a very common shrub on the sea shore, is used for blisters in many parts of the Neapolitan provinces; and, in short, there is a great quantity of medicinal articles of great use and of very powerful efficacy.

**1132.—972.\* BACCINI (GIOVANNI, Florence.**

Brushes made with sorgho, for carpets.

**1133.—892. BENZI, TITO, Carpi (Modena).**

Straw plaits of willow for bonnets.

**1134.—823. BINDA GRUGNOLA, AND Co., Milan.**

Fullers' teazel.

**1135.—2255.\* BUGGIANO, ALESSANDRO, Piacenza.**

Roots of *Andropogon Ischaemum* for brushes.

**1136.—2256.\* CATANIA (SUB-COMMITTEE OF).**

Brushes and rope made with paluetto fibre.

**1137.—904.\* CHERICI, NICCOLÒ, Borgo San Sepolcro (Arezzo).**

Amadou, or German tinder.

**1138.—983.\* FINZI, MICHELE, Carpi (Modena).**

Straw plaits of willow for bonnets.

**1139.—2035.\* MENCACCI, MANSUETO.**

Bottles covered with straw.

**1140.—996.\* MUGGIONI, ALESSANDRO, Piacenza.**

Roots of *Andropogon Ischaemum* for brushes, &c.

**1141.—2032.\* NARDI, RANIERI AND SON, Florence.**

Bottles covered with straw. (See Class xxxiv.)

1142.—244.\* POLENGHI CARLO,  
*Fiorano (Lodi).*

Spin guimauve, for medical uses.

1143.—2262.\* PESARO (AGRICUL-  
TURAL SOCIETY OF).

Amadou, or German tinder.

1144.—952. RENUCCI, VIRGILIO,  
*Parma.*

Straw for bonnets.

1145.—2241.\* REGGIO (EMILIA  
AGRICULTURAL SOCIETY OF).

Mats made with the envelopes of  
the spikes of maize.

1146.—2250.\* SINISCALCO,  
MICHELE, *Baronissi (Salerno).*

Fullers' teasel,

1147.—959.\* SPANO, LUIGI, *Ovis-  
tano (Cagliari).*

Reeds.

1148.—961. TEDESCHI, LELIO,  
*Reggio (Emilia).*

Fine roots of *Chrysopogon Gryllus*,  
for brushes.

Do.	short.
Do.	long and thick.
Do.	not finished.
Do.	fine.

1149.—966. VINCENZI, CARLO  
*Carpi (Modena).*

Willow plait for bonnets.

1150.—965. VINCI, M., *Modena.*

Willow plait.

#### § 8. HERBARIUMS.

Herbs appertaining to the scientific collections will be examined in the Nineteenth Class. Nevertheless, the herbarium of lichens of Professor Martino Anzi, of Como, and that of Italian cryptogamous plants, deserve special mention, because they contain many plants useful in the manufactures and the arts, or proper to be known on account of the damage which they inflict on agriculture. These herbariums deserve to be commended to visitors, both on account of their scientific value and the number of rare and new species, as well as for the care which has been bestowed on their preparation.

1151.—880. ANZI, MONTINO, *Bormeo  
(Sondrio).*

Collection of dry lichens, principally  
from the Valtellina.

1152.—(Wanting).

1153.—(Wanting.)

1154.—2260. SOCIETÀ CRIT-  
TOGAMICA ITALIANA,  
*Genoa.*

Herbarium of the cryptogamous  
plants of Italy.

## SECTION II.

## ANIMAL KINGDOM.

## § 1. WOOD.

The production of wool has become a source of great wealth in Italy, by the extensive breeding of merino sheep, imported and acclimatised from Spain and Bohemia. and the mixed breed which is obtained by crossing the indigenous races; but the necessity for driving the flocks from the mountains during the winter, and making them return there during the summer, is a circumstance which does not conduce to excellence and abundant produce. Many proprietors, particularly in Lombardy and in the Neapolitan provinces, in the Maremmas, at Foggia, and elsewhere, feed numerous flocks of the mixed merinos, from which they obtain fleeces remarkable for their beauty, fineness, and uniformity. The Neapolitan sheep alone produce wool which is exported to the extent of about 2,473,000 kilogrammes. The trials which have been made in Sicily, by Baron Francesco Anca and Baron Niccolò Turrisi, in the mountains of Madonie, for the acclimatisation of the goats of Angora, have not completely succeeded, but give ground to hope that Italy also will one day become possessed of this valuable fleece.

**1155.**—820. BARACCO, BROTHERS,  
*Cotrone (Catanzaro).*

Fleeces of wool.

**1156.**—821. BENTIVOGLIO,  
*CARLO, Modena.*

Wool of the common race.

Wool of the ameliorated race,  
cross between the common sheep  
and the merino of Saxony.

**1157.**—822. BERTONE DE SAM-  
BUY, Marquis, *Turin.*

Sheep's wool.

**1158.**—848.\* CASSANO, FRAN-  
CESCO, *Terra di Bari.*

Wool of 1861. A fleece.

**1159.**—849.\* CONSTANTINO,  
GIUSEPPE, *S. Marco di Caviti*  
*(Benevento).*

Wool, fleece of May and August.

**1160.**—832. GABRIELLE, AN-  
TONIO, *S. Bartolomeo in Galdo*  
*(Benevento).*

Collection of wool of S. Bartolomeo.

**1161.**—834. MACERATA, SUB-  
COMMITTEE OF)

Wool of merinos.

Wool from Visso.

**1162.**—837. ORLANDO, GIOVAN-  
DONATO, *Benevento.*

Wool of May and August.

**1163.**—832.\* PACCIA, Marquis,  
GIUSEPPE, *Benevento.*

Wool from the mixed breed.

**1164.**—838. PANICHI, *Perugia.*

Wool of pure Italian sheep.

**1165.**—840. PONTICELLI, GU-  
GLIELMO, *Grosseto (Pisa).*

Merino wool.

**1166.**—847. VETERE, GIROLAMO,  
*Cerchiara (Cosenza).*

Wool washed during the passage  
of the sheep through the water  
before shearing.

## § 2. SILK COCOONS AND HORSE HAIR.

The manufacture of horse hair is an unimportant business in Italy, where it is used for plumes and for stuffing cushions and mattresses, &c. Brushes are made of pigs' and wild boars' bristles. The feathers and down of several birds serve to make tufts, cushions, mattresses, eider down, and writing pens.

The great riches of Italy from animal textile substances arise from the rearing of silk-worms, a business which is carried on in every part of the Peninsula and the Italian islands, but especially in Lombardy, in Piedmont, and in Tuscany. The revenue from the silk trade reaches many millions, of which at least a fourth is enjoyed by Lombardy, where the crop is about 8,000,000 of kilogrammes.

It has unfortunately much diminished recently, and in the case of some proprietors has been reduced to nothing, on account of the silk-worm disease, which has also infested some of the French provinces. Raw silk, which belongs to another class, will be mentioned elsewhere.

During the last two years several attempts have been made to introduce the silkworm of the *Adanthus*, and with success. This silkworm could be easily reared in Italy, as it requires no particular care, and can live in the open air upon a common plant, which thrives well in barren soils where no useful plants can be cultivated. Its yield ought not to be neglected, as it appears the silk produced from it can be spun.

**1167.**—824. BUSSOLATI, BRO-  
THERS, *Parma*.

Cocoons.

**1168.**—826. CAMPI, G., *Dovadola*  
(*Forlì*).

Cocoons and silk.

**1169.**—823. CHISOLI, ANTONIO,  
*Bergamo*.

Cocoons.

**1170.**—829. CUCCHI, TOMMASO,  
*Parma*.

Cocoons.

**1171.**—1422. GADDUM. G. F.,  
*Torre Pellice (Turin)*.

Cocoons. (See Class 20.)

**1172.**—850.\* GALANTI, Prof. AN-  
TONIO, *Perugia*.

White Chinese cocoons.

**1173.**—833. GARAU CARTA,  
LUIGI, *Sanluri (Cagliari)*.

Opened cocoons.

**1174.**—1439. MASSINA, LUIGI,  
*Calvenzano (Bergamo)*.

Cocoons. (See Class 21.)

**1175.**—835. MILAN (ROYAL SCIEN-  
TIFIC LOMBARD INSTITUTE).

Collection illustrating the meta-  
morphoses of silk worms.

**1176.**—839. PIZZETTI, FERDI-  
NANDO, *Parma*.

Cocoons.

**1177.**—842. SICCARDI, BROTHERS,  
*Mondovì*.

Cocoons.

**1178.**—845. TONI, FRANCESCO,  
*Perugia*.

Cocoons of Chinese yellow and  
white silk.

## § 3. FAT, WAX, STEARINE.

In almost every part of Italy, in the region of the Alps and in the valleys, as well as in the plains on the level of the sea, in the peninsula and in the islands, bees are carefully reared for the sake of their honey and wax.

These two products rank together, and we cannot but award commendation to the quality of the wax collected; although for the use of its manufactures Italy is compelled to import considerable quantities from the Levant.

There are nearly 250 wax manufactories in Italy; the most esteemed are those of Florence, Bergamo, Brescia, Bologna, Savona, Cuneo, Turin, Pontelagoscuro, near Ferrara, &c. The manufacture of M. Julio Carobbi, of Florence, is one of the most considerable, and deserves especial approval for the process employed. It annually works up, on an average, 54,000 kilogrammes of raw wax; that is to say, 33,000 kilogrammes of foreign wax, the best quality of which comes from Turkey, the middling from Spain and Portugal, and even from Algeria, and the common quality from Africa; 7,000 kilogrammes of indigenous wax, and 14,000 kilogrammes of droppings and candle-ends. In this manufacture hydraulic presses are used, and a locomotive of small power. The first quality is sold at 5s. 4d. the kilogramme, and the second quality at 5s. Spermaceti is also made there. The two manufactories of Brescia produce annually 44,912 kilogrammes, representing a value of about £9,800. The whole of the wax factories in Italy produce annually from £360,000 to £420,000.

Tallow serves for the manufacture of candles, for which there are establishments in all parts. The city of Pavia alone reckons five, the productions of which reach as high as 1,000 quintals, and supply some for the neighbouring provinces. The city of Milan has also five candle-making establishments; there are about twelve in the province of Brescia, for the fabrication of 245,412 kilogrammes, which return £14,600. This manufacture is most active in the north.

The use of wax candles has greatly diminished of late years, being now almost limited to churches; and tallow candles, although improved, are less in use since stearine candles have been introduced. On the other hand, the stearine business has become very important during the last few years. There are large stearine works at Venice, Milan, Turin, Florence, Leghorn, and at Calci, near Pisa, each producing nearly 200,000 kilogrammes of stearic acid.

In general the various manufactories make their own sulphuric acid, which is indispensable to them; and they unite soap-making, in order to utilize at once the secondary products of their manufactures. Glycerine has not so large a sale as it might have from its qualities.

**1179.**—711. ASTENGO, BROTHERS,  
*Genoa.*

Manufactured wax.

**1180.**—776.\* BARBAGALLO,  
SALVATORE, *Catania.*

Tallow.

**1181.**—780. BERGAMO (SUB-COM-  
MITTEE OF).

Wax candles.

**1182.**—720.\* CAROBBI, GIULIO,  
*Florence.*

Wax cakes, candles, tapers, and torches.

Spermaceti cakes and candles.

Fanciful objects in wax.

**1183.**—727.\* DE GORI, A., *Sienna.*  
Wax.

**1184.**—735. GHIGO, CLEMENTE,  
*Saluzzo (Cuneo).*

Wax candles.

**1185.**—808.\* LANZA, BROTHERS.  
Stearine tapers.  
Stearine.

**1186.**—740. MAJORANA, Baron,  
*Catania.*

Wax.

**1187.**—741. MANGANONI, LUIGI,  
*Milan.*

Stearine tapers.

M. Manganoni's establishment was commenced in the year 1834. He makes his own sulphuric acid, consuming 100,000 kilogrammes of sulphur. The tallow employed, which comes chiefly from the north of Italy, amounts to 500,000 kilogrammes. The saponification with lime carried on by a self-acting apparatus, only requires 6 per cent. of lime. In the manufacture of soap 60,000 kilos. of soda are annually used, which are imported from France and England. A turbine of three, and an engine of eight horse-power supplies the requisite moving power. The heat requisite for the different operations, and utilizing the various substances employed, is obtained from three boilers of 50 horse-power. The productions are:—

	kilogrammes.
Stearic tapers .....	245,000
Oleic acid .....	225,000
Nitric acid .....	4,000
Sulphuric acid .....	
Soaps in proportion .....	
Sulphate of iron } of acid waters produced	
Sulphate of soda } from the other prepara-	
Sulphate of zinc } tions.	

**1188.**—758. **PENSA, FEDERIGO,**  
*Teramo.*

Wax candles.

**1189.**—2225.\* **SAVORELLI,**  
*Marquis, A., Forlì.*

Stearine and objects of stearine.

**1190.**—2228.\* **SERVENTE (HEIRS OF), Parma.**

Wax.

Wax tapers.

**1191.**—767. **SQUARCI, ENRICO,**  
*Leghorn.*

Stearine tapers.

**1192.**—768. **TACCHI, GIUSEPPE AND Co., Bergamo.**

Manufactured wax.

#### § 4. GLUE, ALBUMEN, CORAL, AND MISCELLANEOUS ARTICLES.

Besides the animal products which we have enumerated, and which form the raw material of special industries, there are many others, the uses of which are less determined in their nature; thus the bones of many animals are applied as artificial manure, for many articles of luxury, such as buttons, common toys, &c. The horns of oxen, which are very large in the Neapolitan and Sicilian districts, are wrought at Naples, with great skill, into domestic ornaments, whilst the offal, hoofs, &c., are used for manure.

In Sicily and in Sardinia the florists make pretty ornamental toys with shells; and with, the hair of the *Pinna nobilis*, which is called *Nacchera*, they make gloves, cravats, shawls, &c.

In the waters of Naples and Sicily they fish for corals of various qualities, red, pink, and black, which the Neapolitans work up with much skill. A large commerce has thus been created, even for exportation, which amounts annually to about £28,760.

The tortoise, properly speaking, is not found in our seas, but at Naples and elsewhere tortoise shell is skilfully worked; and with the melted remains some very pretty articles are made, which pass by the name of tortoise-shell.

The manufacture of false pearls, which are made at Rome with the silvered pigment of a species of fish called bleak (*Cyprinus alburnus*), taken in the Tiber, from which the oriental essence is made, is extensive.

The skins of the shark are utilized by cabinet makers.

The trade of collecting sponges is carried on in several parts of the Adriatic and the Mediterranean, but it is not prosecuted with as much industry as it is in some parts of the Levant.

The manufacture of glue and jellies is carried on with great perfection in Italy. Amongst our excellent manufactures of strong glue, extracted from the flesh and bones of various quadrupeds, the most remarkable are those of Terni, Bologna, Sienna, Santa Maria à Monte, San Miniato, Colle, in Tuscany, Palermo, and Perugia. They produce a glue of a very superior quality, and very tenacious.

**1193.**—825. **CAGLIARI (SUB-COMMITTEE OF).**

Coral from the Sardinian coast.

**1194.**—827. **CARRO, MARIANNA,**  
*Cagliari.*

Bouquet of flowers, composed of shells.

- 1195.**—1666. DESSI MAGNETTI,  
VINCENTO, *Cagliari*.

Silk from *Pinna nobilis*.  
Two pair of gloves in Nacre silk.  
A collar in Nacre silk.

- 1196.**—831. FINO, LUIGI, *Turin*.

Albumen for fixing the colours on  
the stuffs prepared by a new  
process.  
Albumen of blood.  
Hæmathosine for fixing the red  
colour.  
Blood and bones dried for manure.

- 1197.**—851.\* GIOVANNETTI,  
GIOVANNI AND BROTHERS, *Pisa*.

Bone buttons.

- 1198.**—836. MONTALTI, E., *Bologna*.

Fish glue.  
Glue for the manufacture of chemical matches.  
Common Garovella glue.  
Refined glue.  
Sicilian glue.

- 1199.**—841. PUPILLI, GAETANO,  
*Pontedera (Pisa)*.

Strong glue.

- 1200.**—843. SOMMARIVA, BENEDETTO, *Palermo*.

Glue.

- 1201.**—846. VEGNI, LUIGI, AND  
SON, *Cittàdi Castello (Perugia)*.

Strong glue obtained from bones  
and flesh by a new process.

- 1202.**—179. VERCIANI, A., *Lucca*.

Painted ivory. (See Class II., No.  
328.)

- 1203.**—853.\* VACCARO, LUIGI,  
*Cosenza (Calabria Citeriore)*.

Cantharides from the environs of  
Rossano, Calabria.

- 1204.**—825.\* CAGLIARI, (SUB-  
COMMITTEE OF).

Guano from the Sardinian coasts.

- 1205.**—830. DONINI, S., *Bologna*.

Animal manure for the cultivation  
of hemp.  
Horns, hoofs, &c. (See Class XIX.)

- 1206.**—844. SPANO, LUIGI, *Oristano (Cagliari)*.

Natural dung from Vega de Melis.  
Sardinian orchil.

## CLASS V.

### RAILWAY PLANT, INCLUDING LOCOMOTIVE ENGINES AND CARRIAGES.

The small number of exhibitors who have presented themselves in this category would not give a correct idea of the recent development of railways in Italy, unless some brief explanations were afforded on this point. We will, however, give a sketch of the network of railways which covers the Peninsula, in introducing the subject of the factories and the various work performed in them.

In April, 1859, when the first step was taken to unite Italy—up to that period sub-divided into seven governments—the position of the railways in the country was as follows :—

APRIL, 1859.

NAMES OF THE PROVINCES.	KILOMETRES.		
	Opened.	In construction.	Conceded.
Kingdom of Piedmont .....	807	59	—
Lombardy .....	200	40	180
Æmia .....	22	147	276
Marches and Umbria.....	—	—	368
Tuscany .....	308	16	38
Naples.....	124	4	—
Sicily .....	—	—	—
Total .....	1472	266	854

A grand total of 2,592 kilometres of railways sanctioned up to that time.

At the breaking out of the war, the people of Tuscany, Romagna, Parma, and Modena declared themselves for Victor Emmanuel, and the Provisional Governments established in

Tuscany and Emilia emulated each other in completing the lines in course of construction, and extending or reorganising schemes of railways already conceded by the Governments which had preceded them.

In far less time than could have been expected, the Central railway from Bologna to Piacenza was opened for traffic. The Ravenna Railway was authorised, and application was made to go on with the necessary works upon the sections of the lines conceded to the Roman Railway Company, which were on the territory already wrested from the pontifical authority. The Tuscan Government, putting an end to ancient rivalries in respect of petty enterprises so prejudicial to their own interests, and not less so to the public and to the State, united the four concessionary companies. It proceeded to the junction of the railways, at that time unconnected, to Pisa and Florence; it authorised the extension of the central Tuscan railway from Sienna to the frontier of the Pontifical States, near Chiusi, and authorised the junction of two lines previously laid out by a branch from Asciano to Grosseto. And as the concessionary company of the railway from Florence to Arezzo and Perugia did not fulfil the engagements which it had contracted in the Act of Concession, the Government undertook, provisionally, the construction of that line, and decreed, with equitable indemnities, the forfeiture of their concession.

At the same time, in Lombardy and Piedmont, the construction of the lines decided upon was prosecuted with vigour; to which were added those from Torreberetti to Pavia, the concession of the Ligurian coast lines having remained up to that time inactive, as well as that from Turin to Savona.

In April, 1860, after the annexation of Lombardy, of the Duchies, the Romagna, and Tuscany, which inaugurated the new kingdom, the state of the railway system was as follows:—

## APRIL, 1860.

NAMES OF THE PROVINCES.	KILOMETRES.		
	Open.	In Construction.	Conceded.
Ancient Kingdom of Sardinia.....	107	59	41
Lombardy .....	200	40	180
Emilia .....	180	276	—
Marches and Umbria .....	... ..	... ..	360
Tuscany .....	308	140	328
Naples .....	128	—	—
Sicily .....	—	—	—
Total .....	1,623	515	907

a sum total of 3,045 kilometres of railways, for which concessions had been granted up to that time.

Before even the inauguration of the kingdom of Italy, provision was made for the new engagements of the railways of Lombardy and Central Italy, rendered necessary by the treaty of Zurich; and for the line from Reggio to Borgoforte, become for the moment unnecessary while the country of Mantua remained under the dominion of Austria, that from Bologna to Ferrara was substituted, with an extension to the Po, so that being continued ultimately by way of Rovigo and Padua, this last was brought to join the Susa, Milan, and Venice line. At the same time, the construction of the Ligurian railway from the French frontier to Massa was guaranteed, being conceded to a large company, and constructed by the State.

At the period of the first meeting of the Italian Parliament, in February, 1861, the length of the railways already opened was ..... 1,718 kil.  
 In course of construction ..... 1,278 „  
 Conceded ..... 498 „

Total ..... 3,494 kil.

Irrespective of the railways conceded, many companies had made application to Parliament for new lines, and many schemes were submitted for examination, with a view to decide

upon their legality or utility. The concessions for which only the sanction of Parliament was required, was the following:—

1st. The contract of the 3rd October, 1860, with the Company of Roman Railways, for the lines:

From Bologna to Ancona.  
From Ancona to Rome (section Case Bruciate-Orte).  
From Castel Bolognese to Ravenna.

2nd. The contract of the 13th February, 1861, with the Leghorn Company, for the concession of the line to Porta, the ancient Tuscan frontier, as far as Massa.

3rd. Contract of the 13th February, 1861, with the same company, for the Florence line, by Arezzo, as far as the junction with the line from Ancona to Rome.

4th. Contract of the 3rd February, 1861, for the modification of the act of concession of the railway from Naples to the Adriatic, concluded 24th August, 1860.

All these projects were sanctioned by Parliament in July, 1861.

5th. The contract of the 25th September, 1860, which confides to a company represented by M. Adami, the construction of a vast network of railways across the provinces of Naples and of Sicily, which was modified by the act of the 30th April, 1861, and sanctioned afterwards by a law of the 28th July, 1861.

Finally, by the decrees of the 30th April, of the 12th and the 29th May, 1861, it was stipulated that the works from Ancona to Bologna should be forthwith completed, as also the section Case-Bruciate-Orte (of the line from Ancona to Rome), and of the section Capua-Caprano (of the line from Naples to Rome), by the Roman Railway Company, to whom the line from Naples to Ceprano (Pontifical frontier) had just been conceded, with an engagement to complete the works of this line, as well as the others, sooner than had been stated, and to undertake the branch line from Canello to S. Severino.

In order to complete the network of the various lines of Central Italy, the extension of the Central Railway of Tuscany, which the Tuscan Government ought to have made through Chiusi, the shortest road between Rome and Florence was still wanting. The necessity of extending this line of railway as far as the junction of the line from Rome to Ancona, in Umbria, had become manifest; it was accordingly provided for by the agreement of the 19th June, 1861, approved by the law of the 21st July following, by which many different clauses of the previous agreement were modified, with a view of rendering it more in conformity with the scheme generally adopted in Italy. The government was relieved from the necessity of constructing the railway from Asciano to Grosseto, afterwards conceded to the above company, which thereby was placed at the head of a small group of railways of an aggregate length of 327 kilometers.

The law of the 17th July, 1861, decreed the construction of the railway from Milan to Vigevano, and authorised that of Vercelli to Mortara, the first of which was obviously indispensable to render available the section already in operation from Vigevano to Mortara, which without this extension, projected from the first, would have always been very onerous upon the State, which had assumed its guarantee and the working of the line.

The Mortara and Vigevano Milan Railway becoming the shortest line of communication between Milan and Genoa, it was more than ever indispensable to give a new exit to the line from Torreberetti to Pavia, the working of which had been undertaken by the State. In order to supply the deficiency so much felt, of direct railway communication from the provinces of Cremona and Brescia with those beyond the Po and with Genoa, the law of the 21st July, 1860, sanctioned the extension of the line in progress from Torreberetti to Pavia, as far as the junction of the two principal lines—Brescia, Cremona, and Pizzighettone and Milan and Piacenza.

It was still necessary to satisfy the reasonable applications of the Sub-Alpine provinces, entertained by Parliament on the 13th July, 1857; it was requisite to create a Trans-Appennine line parallel with the railway from Alessandria to Genoa, and unite, near the sea, those lines which terminate at Turin and Alessandria, and those which run beyond the Alps by the tunnel of Mount Cenis. On the 21st July, 1861, a law was passed, authorising the formation of a railway from Turin to Savona, with a branch starting from Cairo, and forming a junction at Acqui with the section already opened from Alessandria to Acqui. The concession has just been granted to a company, in virtue of the law above mentioned, and of the contract of the 14th November, 1861.

In June, 1862, the Chamber of Deputies discussed and approved the establishment of a line from Alessandria to Brà, which completes the beautiful Piedmontese network, connecting the Sub-Alpine towns in all directions, across a most fertile territory. In order to connect the above-described trunk railways, it is necessary to form, by degrees, the minor lines of the second and third orders. But, having regard to the public interest and to the national

finances, it was, perhaps, not expedient to undertake them until the greater and more urgent undertakings which had been commenced were more advanced, if not completed; and, in the meantime, the surveying business of the new lines, and the economical requirements of the various provinces would be studied, and, at an opportune moment, the works might be undertaken upon a well-considered and definitively settled plan. It might, nevertheless, be desirable that, previously to that time, enterprising speculators should point out the most advantageous lines to construct and work, such as might be obviously indicated by the nature of this beautiful country, the resources of which are so little known.

The present description would, nevertheless, remain incomplete if it did not point out the main lines, as well as the branches, the execution of which it would not be desirable to delay.

In the first place, in order to facilitate the communication between Genoa, Milan, and Switzerland, it would be desirable to form a short junction from Pavia to the Piacenza and Alessandria road, and at no great distance from the Novi and Tortona branch; and, when that long and difficult question of the passage of the Swiss Alps has been resolved, the junction of that desirable line with the network of the Sardo-Lombard railway can be determined.

The natural course of events will secure the extension of the line of the Tyrrhenian coast as far as Civita Vecchia, and to make a junction at Padua, the railway from Susa to the Po, Alessandria, Bologna and Ferrara, with the Susa and Venice line, by way of Milan and Verona. For the completion of the trunk line, running throughout the whole length of Italy, from the Alps to Naples, without approaching either coast, a railway ought to be constructed, which, starting from Orta, or from any other point on the road between Ancona and Rome, would extend to the Pescara and Ceprano line. The central line would leave the Rome and Naples line near Caserta, and, passing by Benevento, would go on to join the Salerno and Foggia line near Conza, to traverse the Apennines, pass through Altamura, Taranto, and Oria, terminating at the port of Brindisi, which is destined to become, at no very distant period, by its position and natural capabilities, one of the most important ports of Italy.

In a strategic point of view, it ought to be considered whether a railway crossing the Apennines would conveniently form a junction with the line of the Tyrrhenian coast and the arsenal of Spezia, with the Italian Central; and, moreover, whether to connect this arsenal completely with the various fortresses of the great plain washed by the principal Italian rivers, it would be expedient to continue this line as far as the left bank of the Po, and to extend by Mantua the railroad which is about to be constructed from Pavia to Cremona, along this same bank, as far as the junction of the Ferrara and Padua line.

In the Table of Italian railways annexed to this statement, the lines completed, those in progress of construction, and the lines to be conceded are set forth, it being certain that from the very nature of things these latter must after a short delay be authorised.

In the concession of the principal lines, the main object has been to place the different railways under as few companies as possible, in order not to throw difficulties in the way of their ultimate fusion, according as the various lines might make fresh progress, and their working become more and more organised. A more correct knowledge of the scientific and economical requirements will furnish a solid basis for such arrangements, which may be as profitable to the parties interested as to the government and the public in general.

The railways in course of construction, or already opened in the various provinces of the kingdom, are at present appropriated between the Companies and Administrative Bodies enumerated in the following Table, drawn up by the Minister of Public Works, and published in an excellent report, from which we have borrowed the principal part of this present statement. The Table also furnishes a good idea of the grouping of the various lines, which at a more or less distant time may unite the whole of our railways in the hands of a few powerful bodies, of which the existing companies will form the nucleus.

**TABLE OF ITALIAN RAILWAYS**  
**CONSTRUCTED AND IN COURSE OF CONSTRUCTION.**

LINES.	Opened.	In course of construction.	Under survey.	To be surveyed.	TOTAL		
					By lines.	By companies.	By groups.
	kilom.	kilom.	kilom.	kilom.	kilom.	kilom.	kilom.
<b>NORTHERN GROUP.</b>							
Lines belonging to or worked by the State ...	Turin—Alessandria...	91	...	...	91	...	...
	Alessandria—Genoa ...	75	...	...	75	...	...
	Alessandria—Novara ...	66	...	...	66	...	...
	Novara—Arona ...	36	...	...	36	...	...
	Alessandria—Piacenza ...	97	...	...	97	...	...
	Mortara—Vigevano...	13	...	...	13	...	...
	Genoa—Voltri ...	15	...	...	15	...	...
	Turin—Cunéo (without reckoning 13 kil. on the Alessandria line ...)	74	...	...	74	...	...
	Savigliano—Saluzzo ...	16	...	...	16	...	...
	Cavallermaggiore—Bra ...	13	...	...	13	...	...
	Turin—Pignerol ...	38	...	...	38	...	...
	Alessandria—Acqui ...	34	...	...	34	...	...
	Novi—Tortona ...	19	...	...	19	...	...
	Torreberetti—Pavia ...	47	...	...	47	...	...
	Vercelli—Casale—Valenza ...	42	...	...	42	676	...
Lines in course of construction, the working of which might be united with the foregoing ...	From Arona to the Swiss frontier by Ossola ...	...	60	...	60	60	...
	Savona—Carmagnolo ...	...	...	114	114	...	...
	Cairo—Acqui ...	...	47	...	47	161	...
	Voltri to the French frontier ...	...	145	...	145	...	...
	Genoa—Spezia ...	...	87	...	87	232	...
	Vigevano—Milan ...	...	29	...	29	29	...
Lines belonging to and worked by the Victor Emmanuel Company ...	Bra—Alessandria ...	...	83	...	83	83	...
	Suse—Turin ...	63	...	...	63	...	...
	Turin—Magenta ...	116	...	...	116	...	...
	Chivasso—Ivréa ...	33	...	...	33	...	...
	Santhia—Biella ...	30	...	...	30	...	...
Lines in course of construction...	Turin Junction ...	5	...	...	5	...	...
	From Susa to the French frontier (Bardonecche Tunnel)	...	6	39	45	282	1,523
<b>GROUP OF THE VALLEY OF THE PO.</b>							
Lines belonging to and worked by the Lombardy and Central Italy Railway Company ...	Magenta—Milan—Peschiera ...	169	...	...	169	...	...
	Milan—Camerlata (Como) ...	45	...	...	45	...	...
	Rho—Gallarate ...	27	...	...	27	...	...
	Milan—Piacenza ...	65	...	...	65	...	...
	Piacenza—Bologna ...	147	...	...	147	...	...
	Bologna—Ferrara ...	47	...	...	47	...	...
	Ferrara—Ponte Lagoscuro ...	5	...	...	5	...	...
	Milan—Pavia ...	31	...	...	31	...	...
	Bergamo—Lecco ...	36	...	...	36	...	...
	Treviglio—Cremona ...	60	...	...	60	...	...
Ditto, in the Venetian Provinces ...	Gallarate—Sesto Calende ...	...	17	...	17	...	...
	Bologna—Pistoja ...	...	98	...	98	747	...
	Peschiera—Venice ...	141	...	...	141	...	...
	Verona—Mantua ...	36	...	...	36	...	...
	Verona—Trente ...	95	...	...	95	...	...
Lines surveyed by the Government to be conceded to private enterprise, the working of which may be united to that of the same group.	Trente—Bolzano ...	55	...	...	55	...	...
	Mestre—Cormons, limit of the Province d'Udine ...	148	...	...	148	475	...
	Brescia—Cremona ...	...	49	...	49	...	...
	Cremona—Pavia ...	...	74	...	74	123	...
	Pavia to the Po (not authorised) ...	...	44	...	44	44	1,389
Carried forward ...	1,893	523	452	44	2,912	2,912	2,912

LINES.	Opened.	In course of construction.	Under survey.	To survey.	TOTAL.		
					By Lines.	By Companies.	By Groups.
	kilom.	kilom.	kilom.	kilom.	kilom.	kilom.	kilom.
Brought forward ...	1,893	523	452	44	2,912	2,912	2,912
CENTRAL TYRRENIAN GROUP.							
Lines conceded to the Leghorn Railway Company ...							
Florence—Pisa (left bank) ...	80	...	...	...	80	...	...
" " (right bank) ...	95	...	...	...	95	...	...
Pisa—Leghorn ...	19	...	...	...	19	...	...
Pisa—Massa ...	42	...	...	...	42	...	...
Junction at Florence ...	3	...	...	...	3	...	...
Florence—Montevarchi ...	40	...	...	...	40	...	...
Montevarchi—Folligno ...	152	...	...	...	152	431	...
Lines conceded to the Central Tuscany Railway Company ...	150	...	...	...	150	...	...
Empoli—Sienna—Chiusi ...	...	...	...	...	...	...	...
Chiusi—Orte ...	81	...	...	...	81	...	...
Asclano—Grosseto ...	96	...	...	...	96	327	...
Various Lines, the working of which may be combined with the above Companies ...	...	...	...	...	...	...	...
Leghorn—Chiarone ...	205	...	...	...	205	...	...
Cecina—Mojé—Vulturno ...	28	...	...	...	28	233	...
Massa—Spezia ...	40	...	...	...	40	40	...
Chiarone—Civitavecchia ...	...	...	...	45	45	45	1,076
CENTRAL ROMAN GROUP.							
Lines held by the Roman Company, and worked by them in the kingdom of Italy ...							
Bologna—Ancona ...	206	...	...	...	206	...	...
Naples—Presenzano ...	90	...	...	...	90	...	...
Cancello—San Severino ...	43	...	...	...	43	...	...
Presenzano—Ceprano ...	50	...	...	...	50	...	...
Castel Bolognese—Ravenna ...	41	...	...	...	41	...	...
Case Bruciate—Orte ...	197	...	...	...	197	627	...
Rome—Ceprano ...	122	...	...	...	122	...	...
Rome—Civitavecchia ...	73	...	...	...	73	...	...
Ditto, in the Roman Provinces ...	12	...	...	...	12	...	...
Rome—Frascati ...	10	...	...	...	10	...	...
Orte—Rome ...	84	...	...	...	84	301	...
Gort. Line, the working of which ought to be connected with the above...	...	15	22	...	37	37	965
SOUTH NEAPOLITAN GROUP.							
Lines constructed by the State ...							
Ancona—S. Benedetto del Tronto ...	90	...	...	...	90	...	...
Santo Benedetto—Pescara ...	71	...	...	...	71	...	...
Pescara—Foggia ...	175	...	...	...	175	...	...
Foggia—Bari ...	72	...	...	...	72	...	...
Bari—Brindisi ...	...	...	...	...	...	...	...
Brindisi—Lecce ...	105	...	...	...	105	...	...
Lecce—Otranto ...	40	...	...	...	40	...	...
Pescara—Turri ...	29	...	...	...	29	...	...
Turri—Popoli ...	26	...	...	...	26	...	...
Popoli—Solimona ...	...	...	...	...	...	...	...
Solimona—Ceprano ...	161	...	...	...	161	191	...
Foggia—Ponte San Venere ...	50	...	...	...	50	...	...
Ponte San Venere—Eboli ...	101	...	...	...	101	...	...
Eboli—Salerno ...	30	...	...	...	30	1,056	...
Line conceded to the Bayard Company ...	48	4	...	...	52	...	...
Napoli—Salerno ...	...	...	...	...	...	...	...
Castellamare Branch ...	8	...	...	...	8	60	1,116
CALABRO SICILIAN GROUP.							
Lines to be constructed by the Government on the Continent ...							
Bari—Massafra ...	...	...	79	...	79	...	...
Massafra—Taranto ...	...	...	15	...	15	...	...
Massafra—Reggio ...	...	...	50	363	413	567	...
Palermo—Trabia ...	40	...	...	...	40	...	...
Trabia—Catania ...	...	...	60	130	190	...	...
Ditto, in Sicily ...	...	...	...	40	40	...	...
Messina—Catania ...	...	...	70	...	70	...	...
Catania—Syracuse ...	...	...	90	90	430	937	...
LINES IN THE ISLAND OF SARDINIA.							
Lines in the Island of Sardinia ...							
Cagliari—Oristano ...	...	...	...	93	...	...	...
Oristano—Bono ...	...	...	...	82	...	...	...
Bono—Tolovo ...	...	...	...	52	...	...	...
Tolovo—Gulf of Oranges ...	...	...	...	72	...	...	...
Tolovo—Sassari ...	...	...	...	45	...	...	...
Sassari—Porto Torres ...	...	...	...	19	...	...	...
Sassari—Alghero ...	...	...	...	44	407	407	407
Total kilometres ...	2,944	1,912	1,026	1,531	7,413	7,413	7,413

## SUMMARY OF LINES.

	Opened.	In course of construc- tion.	Under survey.	To be sur- veyed.	Total.
	Kilom.	Kilom.	Kilom.	Kilom.	Kilom.
Lines surveyed or opened by Government ...	676	693	667	1,035	3,061
Groups owned or opened by Private Com- panies .....	1,576	1,135	369	485	3,576
Total .....	2,252	1,828	1,026	1,531	6,637
Lines conceded to the Lombardo-Roman Company in the Venetian and Roman Provinces .....	692	84	—	—	776
Total .....	2,944	1,912	1,026	1,531	7,413

Some details of the receipts and expenses in 1861 of some of the Italian railways may be here inserted :—

## SECTIONS OPENED BY GOVERNMENT.

	£	s.	d.
Genoa and Arona line (270 kil.), gross receipts .....	554,885	16	0
"                    receipts per kilometre .....	2,055	2	6
Piacenza line (116 kil.), gross receipts .....	113,310	12	6
"                    receipts per kilometre .....	9,760	16	6
Cuneo and Saluzzo line (103 kil.), gross receipts .....	79,913	5	0
"                    receipts per kilometre .....	775	16	0

## SECTIONS OPENED BY THE VICTOR EMMANUEL COMPANY.

	£	s.	d.
Turin and Ticino line, net revenue per kilometre .....	1,419	4	0
"                    expense per kilometre .....	572	17	6
"                    net profit per kilometre .....	846	14	0
Lombard group, gross receipts .....	262,221	4	0
This group has cost in construction and purchase of plant .....	3,005,325	12	6
Po Valley group, gross receipts .....	148,460	4	0
Construction and purchase of plant .....	2,928,630	16	0
Leghorn group, gross receipts .....	154,935	10	0
Construction and purchase of plant .....	2,533,993	14	0

In Italy there are two large locomotive factories, one in Liguria, the other in Naples.

The former, that of Ansaldo and Co., of S. Pier d'Arena, near Genoa, is connected with the Turin and Genoa and Ligurian railways by a special branch. This establishment employs more than 600 workmen, of whom 110 are in the foundry for large castings, 40 in the smaller; 15 brass finishers; 120 men at the thirty forges, three large steam hammers and three reverberatory furnaces; 60 boiler-makers; 30 carpenters and pattern-makers; 60 turners and fitters; 7 draughtsmen; 40 masons and labourers, and 12 foremen. This establishment delivered to the Genoa and Cuneo railways 300 turntables, of 6,000 kilogrammes each, at the rate of two turntables daily, from January 1st, 1863; an immense quantity of large iron work for waggons, and more than 20 locomotives. With the means at their disposal they can make twelve locomotives yearly. Those they have constructed are made upon the best principles, according to a pattern conceived in the establishment, in which are exclusively employed Italian workmen and engineers. According to the reports of the general administration of government railways, the cost of repairs of locomotives supplied by this establishment is  $7\frac{1}{2}$  per cent. less than that of locomotives made elsewhere, which fully proves that the work has been carefully executed.

Shops for effecting repairs are attached to all the great lines of railway.

The administration of railways worked by the State has a vast factory at Turin, occupying an area of 33,040 square metres. It employs 600 workmen, carpenters, smiths, painters, upholsterers, turners, founders, boiler-makers, fitters, &c. It has thirty-four forges, three steam engines, a reverberatory furnace, and several steam-hammers. Railway carriages and waggons, wheel-tyres, boilers, and the principal parts of locomotive engines are made and repaired therein. These various works absorb an annual expense of two millions, a sum which will not appear exorbitant when we consider that the works embrace a rolling stock applicable to 676 kilometers of railways held or worked by the State.

There is also the factory at Savigliano, where waggons are constructed on account of the Government. It is in a position to deliver 300 to 400, or indeed any number required by this group of railways. Three or four hundred workmen are employed in this establishment, receiving from 1s. 3d. to 4s. 2d. per day.

The Lombardo-Venetian and Central Italy Railway has three factories, the most important of which, that of Verona, will bear comparison with that of any other company at home or abroad. It contains a spacious covered building, with six cranes for the fitting-up of locomotives, and three buildings of smaller dimensions for the same purpose; a large turners' shop, fitted up with lathes and tools of the best description; forges, with two large steam-hammers. 500 workmen are employed, receiving wages varying from 1s. 6d. to 4s. 2d. per day.

This same railway company has at the Porta-Nuova Station, at Milan, a second factory, which has been joined to that at Porta Vittoria; 250 workmen are employed. At Bologna there is a third factory belonging to the company, employing about a hundred workmen.

Close to the establishment at Verona there is also that of MM. Froissard and Co., employed in the preparation of three-fourths of the new materials required for the Lombardo-Venetian and Central Italy railways. They employ 400 workmen. Not far from the factory at Milan, MM. Grondona, Miani, and Zambellini have a factory, with 280 workmen; they have undertaken to supply a part of the rolling stock of the railway companies.

The repairing shop of the Leghorn roads, the most important in Tuscany, is distinguished by its extent and by the important character of the work executed there. It employs more than 300 workmen, and is fitted up with excellent machines, set in motion by an engine of 25 horse-power. The repairing house of the Lucca branch is of less importance; its motive power is about 14 horses. Establishments are at present being formed for the service of the Neapolitan railways.

The following are the objects exhibited in this class, with the names of the Exhibitors:—

## 1207.—1007. AGUDIO, TOMMASO, *Turin.*

### Funicular locomotives for steep gradients on railways.

Up to the present time the means employed on railways to ascend steep gradients have been ropes worked by stationary engines, atmospheric pressure, and locomotives of great weight. Large cable ropes are still employed on some lines, but for the most part the locomotive has superseded all other methods.

Upon gradients of twenty-five to thirty in a thousand, such as we have instances of upon many railroads, two engines coupled together, weighing 26 tons, capable of dragging a train of 90 tons, at ordinary speed, have been employed, but the great expense of wear and tear, and the great cost of fuel have directed the attention of engineers to discover a more efficacious principle.

M. Agudio's plan of using a cable provides a remedy for the objections which exist against heavy locomotives, and it is itself free for the most part from defects ascribed to the ordinary cable rope; the greatest of which

are, that it is only applicable to very short distances; that it requires a great motive power to overcome the friction; and only one rope can be used, upon the strength of which the security of an entire train depends. The rope being required to fulfil the double function of supporting the train, so that it shall not slide down the declivity, and to drag it up the hill, it is necessary to make it of very large dimensions, which renders it proportionally heavy, increases the friction by reason of the weight and diameter, and prevents its practical employment for a distance of more than two kilometres.

M. Agudio's plan remedies this serious defect, and others of less importance; its most advantageous application would be in long gradients of twenty-five to thirty in a thousand, or even on steeper ones. The motive power may without difficulty be placed at eight or ten kilometres; the security of the trains is thus rendered complete; they may be stopped, reversed, or resume their onward progress at will, as practised with the ordinary locomotives, all this being accomplished whilst the rope continues in motion.

M. Agudio obtains these remarkable results

by the employment of two ropes, made of iron wire, one of which is very large, and the other very small. The large rope is placed in the middle of the line, its sole object is to communicate to the train in motion the necessary power of adhesion, being made to run on a series of pulleys, judiciously placed upon the locomotive, to which it affords such a grasp as to allow it to move on. This arrangement is precisely similar to the well-known principle of towage, by which boats ascend rivers by the aid of an iron chain lying along the course of the stream.

The only purpose of the second rope, which is lighter than the above, is to transmit a rotary motion to the pulleys placed on the locomotive. These pulleys allow the power of the descending rope to be utilised, which in the old system was useless; it now performs half the traction, since the two lines of rope work with equal impulse; and although they run in a contrary direction to each other, they each give an impulse to the train through their judicious disposition, which causes the pulleys to revolve in the same direction. The diameter of these pulleys allows a velocity to be given to the rope double that of the train. It follows that in this new principle, by the two-fold working of the two lines of rope and by the double speed, the friction of the moving rope is reduced to one quarter of that which, under the same circumstances, would be developed in a system of direct friction, thereby allowing the weight of the rope to be reduced in the same proportion. It also results that in the new principle the resistance is greatly reduced, and that consequently it requires a distance of from 7 to  $6\frac{1}{2}$  miles to produce the equivalent amount of resistance to that which exists in a length of from one to two miles in the ordinary way.

As the motive power can be placed at a distance of six or eight miles, it would be possible to derive the very great advantage of being able to find, in such a long journey, some falls of water, always very plentiful in the mountainous parts, which would supersede the expense of employing steam for drawing the trains.

To be convinced of this, it is sufficient to reflect that 90 gallons of water per second, employed during half an hour, the usual time a train takes to ascend a gradient of 35 in a thousand, six and half miles long, divided between several stations, are sufficient to give an effective constant power of more than 200 horses, after allowing liberally for loss of power. With these data it may be affirmed that in all places where local circumstances permit of the economical employment of a fall of water, the system of M. Agudio is preferable to every other to overcome these difficulties, which up to the present time have induced engineers to abandon the use of stationary engines.

The jury of the Exhibition of Florence, in 1861, awarded a medal to M. Agudio, expressing their hopes to see his new apparatus at work, which when accomplished seems destined to produce a great change in mountain railways, as well as a great economy in the working. And, in fact, an Italian company, of which his Royal Highness the Prince of Carignan is chairman, has been formed to make experiments, with a full-sized rope and machinery, upon a gradient of three in 100, in a length of one and half mile, the road being curved in the shape of an S, with a radius of about 300 yards, on the gradient of Dusino, near Turin. These experiments will shortly be made with the apparatus already prepared. The moving rope will weigh only 1 kilogramme per running metre, and will draw a train of 120 tons with a speed of  $16\frac{1}{2}$  miles per hour, whilst the gradients of Liège, which are one-third shorter, and in a straight line, can only draw trains of 80 tons. In order to avoid the inconvenience of fixed pulleys, employed at present to support the rope along the road, and which produce very considerable friction by their *vis inertiae* and the very great friction of their axes, which cannot always be conveniently greased, and thereby contribute to the rapid wearing out of the cables, M. Agudio has availed himself of the lightness of his rope to use very small fixed pulleys, the axes of which turn upon friction rollers, which do not require greasing. Their shape allows the rope to turn upon very small curves, which, with the rest, forms a very convenient arrangement for the mountainous nature of the Italian railways, and for other countries where great heights have to be ascended.

## 1208.—1003. TURIN (ENGINEERING SCHOOL).

Model of a locomotive.

## 1209.—1000. FUSINA, VINCENZO, *Pavia*.

Atmospheric railway, having a tube without valves.

## 1210.—1008. LUÉ, ANGELO, *Milan*.

Wooden model of a horse tram-road.

Between the means of carriage employed on common roads, and those of railways, a middle principle has been found. That is by iron rails let into the high road, in such a manner as not to cause any obstruction to the circulation of ordinary vehicles, and al-

lowing, at the same time, special carriages, drawn by horses on the tram, to effect a great saving of wear and tear over the means of carriage generally in use.

In Europe Loubat's system is the principle best known, as worked between the Place de la Concorde at Paris and Versailles. Nevertheless, daily experience has sufficiently proved that the hollow of these rails, becoming filled incessantly with earth and stones, require continual supervision to keep them clean, and does not prove so economical as might be expected. For this reason his system has not been generally adopted. M. Lué, the engineer, has offered a new tram-rail for the same purpose, but designed with a particular arrangement, with a view to avoid the serious inconveniences which result from the use of the Loubat tram-rail, as well as those arising from tram-rails in form of a T, more or less projecting above the plane of our roads. M. Lué proposes a double cylindrical rail, each part  $1\frac{1}{2}$  inches in diameter, joined together like two gun-barrels. These rails, only projecting three-quarters of an inch, do not cause any considerable difficulty upon the ordinary roads, and as, moreover, when in this form they may be kept always bright, the friction is the smallest possible. They are made in such a manner that when worn out on one side they may be turned over on the other. The chairs are slightly inclined on the rails, in such a manner as to give them sufficient stability, which dispenses with the necessity of having recourse to expensive methods in use on railways on which heavy waggons run at great speed.

Moreover, the double tyre, applied by M. Lué to the wheels of his waggons, is of such a shape as to enable the wagon to be run off the rails at pleasure, so as to travel on the common roads.

At the Florence Exhibition, a medal was awarded to M. Lué for the admirable form which he has given to his rails, his chairs, and the tyres of his wheels.

### 1211.—1002. PIETRARSA (ROYAL RAILWAY ESTABLISHMENT), *Naples*.

Complete six-wheeled locomotive.

The factory of Pietrarsa is provided with a steam engine of twelve horse-power, good machinery and implements, with forty fitters' benches. One moveable and two fixed cranes are used in the carriage department. The forges and the boilers are provided with machines for cutting and punching holes in thick iron plates, which are bent and curved with the aid of a reverberatory furnace. One great ventilator serves for the thirteen forges. In this establishment five hundred

workmen, draughtsmen, modellers, fitters, riggers, &c., are employed. Since 1860 the factory has constructed six locomotives, named severally, Pietrarsa, Corsi, Robertson, Vesuvius, Maria Teresa, and Etna, which, at a more recent period, have been followed by several others.

### 1212.—1009.\* SIPRIOT, COSIMIRO, *Milan*.

Unbleached tarpaulin for waggons.  
Waxed tarpaulin do.

### 1213.—1004. VANOSSI, GIUSEPPE, *Chiavenna (Como)*.

New system of steam engines, applicable for railways and steamers.

### 1214.—1005. VELINI AND Co., *Milan*.

Model of locomotive tender, applicable for steep inclines. Grassi's system.

### 1215.—1006. VINCENZI, EUGENIO, *Modena*.

Model of an electric safety signal to prevent the collision of railway trains.

The new system of signals to give notice of the approach of trains, in order to guard against accidents, consists in establishing near the rail, at intervals of half-a-mile, a bar of horizontal iron supported by two posts about the height of the waggons. These bars of iron are placed in direct communication, by means of a wire fixed to the posts of the existing telegraph, and communicating with the station by a distributive apparatus and by a local battery.

Upon the tender of the locomotive, at a height corresponding with the bars of iron just referred to, are fixed four steel springs, which touch the bars as the train passes. These springs are in communication with the poles of a second moveable battery placed on the tender of the locomotive, and which discharges its other pole in the earth by communicating with the wheels and the rails. In the circuit of this pile a bell is fixed, set in motion by an electric spring, which by ringing warns the driver if any accident has occurred on the line, and the instant the springs come in contact with the iron rod.

The mode of operation is simply as follows:—All the down trains starting from the principal station have the positive pole of the battery in connection with the touch spring, and the negative with the earth; the station must therefore have the positive pole of the battery in communication with the wire of the line, and the negative with the earth. The up trains, on the contrary, running in the direction of the central station, must make the communication of the battery the converse of that of the down trains, that is to say the negative pole with the touch spring, and the positive pole with the earth; the stations must place the negative pole in communication with the wire of the line.

The arrangements thus established, the train running along the line will encounter the iron rods, which communicate with the wire of the line, and which are in connection with the positive pole of the battery at the station, and touching them at the moment of its passing by means of the steel springs, which, as we have said are in communication with the positive pole of the battery at work on the locomotive, the combination of the positive poles of the two batteries will be effected, and neutralize each other, accordingly no electrical action will result, and the bells will not be set in motion; but if whilst a train is running, the station should reverse the pole of its battery, or the wire put in contact with the rails, or another train coming in the opposite direction is running upon the same line of rails as the first, no sooner will it touch one of the iron rods in communication with the wire corresponding with the station whence the first train has started, than the bells will give the alarm, because at that moment the combination of the two similar poles, that is to say, the action of the local battery upon the wire of the line will have ceased, and the batteries of the two trains will be able to accomplish their circuit with the ground by means of the wire. By this simple contrivance the following results are secured:—

1st. The establishment of an instantaneous communication between the trains and the stations, and *vice versa*.

2nd. The means of giving notice at the next

station of the position of the train on the line or of the occurrence of any accident.

3rd. In the event of two trains running in the same direction, if one is under the necessity of stopping, notice can be instantly given to the train following.

4th. Two trains, running towards each other on the same line of rail with the danger of meeting, would be warned immediately so as to enable them to stop in time.

5th. On railways with two lines of rails it sometimes happens that a train is placed on the wrong line; when this happens notice would immediately be given.

6th. Every signal-man remaining at his post on the line, can communicate to the station as well as with the trains in motion whenever the rail is out of order, or if any accident whatever has occurred of a nature to block up the line.

7th. If a train has started from the station through any mistake, the station-master can make the requisite signals so as to cause it to stop or return, as he pleases.

8th. At each station, before the train starts, all the parts connected with the system can be controlled by a simple and prompt means, so as to guarantee the certainty of the electrical action.

Its advantages are, the trifling expense which the system incurs both in its construction and maintenance. Thus many signals placed along the railroad, employing a great number of men, can be dispensed with; fewer persons are needed for the supervision of the curves, tunnels, lines, and covered ways; finally, a perfect certainty in the action of the signals, at present so uncertain through the remissness of the signal-man, may be secured.

Experiments of this system on a large scale as to its efficiency, were made at Florence in October last, upon the Arezzo railway, and the results were so satisfactory, that the directors of the Central Railway of Tuscany have solicited from government the authority to apply it to their line; and after having consulted the body of Civil Engineers and the Royal Commissioners for Railways, the concession was granted by the Board of Public Works, under date of the 16th April, 1862.

## CLASS VI.

### CARRIAGES NOT CONNECTED WITH RAIL OR TRAM-ROADS.

The building of carriages is a very important business in Italy, especially in the north, at Brescia, Pavia, Bologna, Genoa, and Turin. In the city of Milan alone, there are sixty factories, giving work to 3,000 operatives, who produce, besides a number of small conveyances, more than 1,000 ordinary carriages, and about 450 coaches of a more costly character, representing an annual value of about £12,000; their exportation is very important, especially to Germany, where the Milanese carriages are highly valued for their superior taste, convenience, and lightness, combined with perfect solidity. For the axles, tyres, and other iron work, the excellent iron of Lombardy is made use of. The best varnishes are still imported from France and England.

**1216.**—1014.\* BERTI, PIETRO,  
*Milan.*

State carriage, with harness complete.

M. Berti, state carriage maker, has given a

specimen of the improvements and splendour of his manufacture by a magnificent carriage and harness for state ceremonials.

**1217.**—1015. SALA, CESARE, *Milan.*

Carriage.

## CLASS VII.

### MANUFACTURING MACHINES AND TOOLS.

#### SECTION A.

##### MACHINERY EMPLOYED IN SPINNING AND WEAVING.

There are in Italy, especially at Turin, Naples, and Milan, numerous steam spinning mills for winding cocoons and making tram and organzine. Most of the great centres of manufacturing industry in Italy also possess hand-loomes of every sort, for spinning or weaving silk, hemp, flax, and cotton; but these latter, as well as manufactories of cards, spindles, and weaving

machinery, are seldom of great importance, as they only employ a small number of workmen. The implements specified in this class, and which are used in weaving cotton, wool, and flax, as well as the cards, spindles, and the steel points for the combs, are for the most part of foreign manufacture.

In the silk manufacture, from the winding of the silk from the cocoons to the weaving of silk stuffs, many improvements have been introduced in the implements employed. Amongst these improvements we may mention the electrical process of M. Bonelli, for the weaving of all kinds of stuffs; and the ingenious machine of Lieutenant Vincenzi, of the Artillery, which allows smaller and lighter cards to be used than those hitherto employed.

**1218.—1078.\* BATTAGLIA, GIOVANNI, *Germignana (Como).***

Apparatus for winding cocoons.

**1219.—1020. BONELLI, GAETANO, *Turin.***

Electric loom for weaving any kind of materials.

The Jacquard loom was transmitted to us, with the exception of some accessory alterations, in the state in which its ingenious inventor first made it. M. Bonelli, by pursuing an entirely new method, has completely altered the nature of this machine; he has made it more economical and convenient, and, by simple methods, has rendered it capable of producing very remarkable effects. When the inventor, struck by the facility with which electricity could be employed, conceived the idea that it might be used in weaving, he laboured to apply it to the making of the pattern to be reproduced on the cloth, either by means of a metallic surface covered with perforated cards, or with an isolating varnish, or by means of an isolating surface covered with a metallic plate. He conceived the idea of supporting on this plate a series of teeth closely set, but separate from each other, each of which would correspond with an electro-magnet. Having thus obtained a process by which he could see the design, he applied it to cloth with complete success. It is well known that, in machine-made cloths, the pattern is formed by some threads of the warp, which, being raised in a certain order, leaves uncovered the woof which shews itself on the ground, either by the colour or the quality of the thread. To each tooth of the guiding comb is attached a thread, which is raised, or which remains in its place, according to the current determined by the electro-magnet, and, transmitted to the opposite tooth, impinges upon the conducting surface, or the isolated surface of the design. In the first method employed by the inventor, each thread was attached to an upright iron pin, which, upon each motion of the handles, came in contact with the electro-magnet; the electro-magnetized pins remained then suspended, whilst

the non-electro-magnetised pins fell again with their threads. At each step, as the pattern was formed under the comb, the line upon which it rested progressed in like manner, and changed at every motion, as well as the magnets and the threads which they held, and in this manner the pattern was reproduced exactly upon the cloth.

Under these circumstances the electro-magnets, which supported the threads and their lead counterweights, must be of considerable power to keep firm hold of the pins attached. M. Bonelli, in his patent, urged greatly the utility which might be derived by preserving the Jacquard loom, and indicated the means of applying to it his new process, which allowed the cards to be got rid of. After much study and innumerable experiments, M. Bonelli exhibits an improved machine, in the use of which it is no longer necessary for the designs to be so placed on the card, but in which a moveable part, consisting of a single and perpetual band or card, is made use of, in which the holes open or remain closed according to the nature of the pattern, and this band, put in motion by the treddles, either repels the needles at each movement, or leaves them in their places. M. Bonelli has, moreover, found means to make with his loom cloth of different colours without having recourse to changing them. Nothing therefore is wanting to this ingenious apparatus, which will now meet all the requirements of the weaver's art.

**1220.—1079.\* BOLGÉ, TERESA, *Brescia.***

Combs for carding flax, No. 1, 2, 3, 4.

Do. for carding No. 5.

Hair combs.

**1221.—1021. BOSSI, LUIGI, *Milan.***

Screw silk loom, which the exhibitor has already substituted in some mills in Lombardy in lieu of those which were previously in use for weaving silk stuffs.

The most important of the modifications introduced by M. Bossi, consist in substituting for the rope which moves the frame which distributes threads of different qualities to the spindles a spiral screw, upon which the frame itself is fixed. This new method avoids the inconvenience of the old loom, in which the moving cord, stretching or tightening according to the atmospheric changes, produced an irregularity in the motion of the threads, and in their transmission to the spindles. Moreover unknown to the workmen, the rope was subject to get worn out and to snap, by which everything was put out of order, and the threads of the warp were always breaking, and could only with difficulty be used again. By a judicious arrangement, M. Bossi prevents the excessive superincumbent weight of the warp, which is essential to preserve elasticity and uniformity to the cloth; and nevertheless, whilst the lengths from the common looms do not usually exceed 140 metres, it will reach 240 metres with the new screw loom.

The colouring of the spindles, which turn with great rapidity at the same time with the bobbins, quickly warns the workman of the broken threads which have to be joined. There are no longer warps with deficient threads, which always impairs the beauty of the cloth, and the danger is avoided of going beyond, or of entangling the work, which often happens when seeking for the broken thread, and the operation of setting the warp is rendered much more easy and expeditious.

This arrangement is capable of being applied to all the common looms.

**1222.—1030.\* CAMPI, GIUSEPPE,**  
*Bellosguardo (Florence).*

Weaving apparatus by means of a *bain marie* in spinning silk.

New system of alternate motion for spinning silk.

Implement to twist the silk in the reel.

A single fire-place communicates the requisite heat to a number of small cisterns.

The new alternate backwards and forwards motion in a single piece performs its function of distribution more easily and with economy.

Simplicity and solidity form elements of value in the machine for twisting silk. This machine is made at Forlì, by M. Bonavita, and costs £5.

(See, for the description of the apparatus, a memoir of M. Ant. Torgioni Tozzetti, to the Academy of Georgofili of Florence.)

**1223.—1022. DELPRINO, MICHELE,**  
*Vesime (Alexandria).*

Model for a new apparatus for economic weaving.

The exhibitor, an extensive silk-grower as well as a good farmer, calls this a system of central traction by means of air, and has certainly carried the art to great perfection.

**1224.—1023. DELAPIERRE,**  
*FRANCESCO, Naples.*

Combs of steel wire for silk looms.

**1225.—1024. FORNARA, GIO-**  
*VANNI, Turin.*

Weaving combs.

**1226.—1025. FRIGERIO, GIU-**  
*SEPPE, Molteno (Como).*

New system of preparing cocoons for spinning.

The apparatus of this exhibitor tends to shorten, as much as possible, the duration of the contact of the cocoons with water in the preliminary process of beating.

It thus secures an advantage of from 6 to 10 per cent. in the yield of the silk, a saving in the consumption of fuel, and in the management of the operation. A female worker can easily supply 15 to 20 women for weaving.

**1227.—1026. GUPPY AND PAT-**  
*TISSON, Naples. (See Class 1,*  
*No. 55, and Class 31).*

Iron apparatus for spinning silk;  
price 1,700 lire.

**1228.—1031.\* MANGANO, AN-**  
*TONIO, AND SON, Messina.*

Apparatus for twisting and making  
orgazine silk.

**1229.—1039.\* PISA (SUB-COMMIT-**  
*TEE OF)*

Weaving loom.

Implements employed in cotton  
manufacture.

**1230.—1040.\* ROSSI, PASQUALE**  
AND Co., *Bibbiena (Arezzo).*

Spindles and weaving instruments  
in wood.

**1231.—1027. SANROMÉ, MOSE,**  
AND BROTHERS, *Como.*

Combs of various sizes for weaving.

**1232.—1028. SILVATICI, GIO-**  
VANNI, *Vico Pisano (Pisa).*

Cards for wool and cotton.

With the system adopted by the exhibitor the points of the steel pins may be given at a different angle, and proportioned to the diameters of the cylinders upon which the leather is to be rolled. The cost of making the cards is considerably higher, but the special circumstances allowed the exhibitors to make no alteration in the sale prices, below those made in France and England.

**1233.—1029. VINCENZI, EUGENIO,**  
*Modena.*

Weaving loom.

The Académie Universelle des Arts et Manufactures of Paris, unanimously awarded an honorary medal to M. Eug. Vincenzi for his new system of Jacquard loom.

The reasons for this decision of the Academy are given in a report, of which it is best to give a translation, as follows:—

“In the year 1856 a Society instituted for conducting experiments at Lyons, composed of the most competent judges, fully sensible of the immense advantages of the new system of M. Vincenzi, did not hesitate to afford him encouragement by its powerful patronage, and placed at his disposal sufficient capital to enable him to set up a loom, which, although incomplete at present, is likely to result in great improvements. Since that time M. Vincenzi, free from all restrictions, has made immense progress, and, thanks to his skill and his great acquirements, he has succeeded in bringing to perfection a loom, which, when compared with that of the old system, leaves it so immeasurably behind, that it may be safely predicted that in a short time no other than Jacquard's improved loom will be used. In short its advantages are innumerable.

“In the first place, M. Vincenzi substitutes, without inconvenience, paper for card, and that in such proportions that the reduction of the size is about 60 per cent., and effects an

economy of 50 per cent. in the returns. In consequence of this change a great facility is obtained in the pricking out the designs, for the simple reason that, the paper being much thinner than the card, many leaves can be perforated at the same time. The workmen employed in this labour are also less fatigued, as the implements which are used in the process are also of less weight.

“This sensible reduction is more easily explained by showing that a 400 Jacquard card is 38 centimetres long, whilst Vincenzi's card of only 400 is 12 centimeters, a diminution in favour of the latter of two-thirds.

“The loom which M. Ritton, the representative of M. Vincenzi, has submitted to us, is one of 1,200; compared with that we have one of 400 of the old Jacquard principle; the two looms occupy an equal space. In this double point of view the new principle of M. Vincenzi deserves your highest approbation.

“I recommend the ingenious arrangement which the inventor has adopted in introducing needles into his design to your attention. In the ordinary Jacquard loom the batten describes the arc of a circle, in order to meet the needles; this makes it necessary to perforate holes for the design rather larger than is necessary, in order to hold the five needles; the card, placed upon this batten, moves with a sharp movement upon these needles. Those which touch the holes of the card run into it; those, on the contrary, which meet only the card are thrust back; this operation cannot be performed without a certain shock, hence the necessity for having a card sufficiently strong to resist the blows which it receives. On the other hand, in Vincenzi's plan, the needles impinge upon the paper of the batten without any shock. Thus small discs alone, which are placed on the sides of the machine, leave the needles to the action of their springs; those which reach the paper rest there, and those which force the holes perforate them.

“It is easy to imagine that the batten being at a fixed point, whilst the needles work horizontally, the holes in M. Vincenzi's paper require to be just the size to receive their allotted number of needles required, hence the advantage of the substitution of paper for card. In the arrangement which is the subject of this report, the upper part of the loom is entirely free, so that the workman, if he wants to right a stitch, or to alter one or more of the needles, is only occupied a few minutes. On the other hand, in the old way, these changes required many hours' work, inasmuch as the upper part of the machine, being encumbered by weights and spring, which rested upon the supports from above, the workmen could not easily find where the fault was, without unrigging the entire machine. Thus, if it was necessary to take out one or many needles, an entire row had to be

taken out. In the new system, it is possible to remove or fit up one or many needles without rendering it necessary to disturb the smallest part of the pattern.

"You will see, gentlemen, that we are advancing from one degree of perfection to another, which justifies us in saying that, from the inception, we not only have to call your attention to an improvement, but, what is still better, to a complete invention.

"I must go on to say, the system of Vincenzi allows us, by the new arrangement of the treddles, to proceed with the entire design upon the cylinder. Besides, in consequence of the machinery not being so high, its convenient size and the great diminution of its weight, enable it to be placed in rooms with lower ceilings, at the same time affording more light to the workman. The cost of this loom is very moderate, and would enable every workman to become a purchaser of one. Its working is simplified and light, and does not require much study to work it. A workman, after a few hours' application, will quickly understand its construction.

"You will, therefore, gentlemen, see that the Vincenzi loom is destined to produce a great revolution in weaving. Already Lyons, which occupies the first rank in this branch of industry, has eagerly adopted this new machine; Paris has followed the example, and one of the first manufacturers in that city has set up a loom, which he commends very highly.

"Operative weavers take a great pleasure in the adoption of the new system, and extol the advantages which it combines.

"In consideration of this, gentlemen, this commission begs you to confirm the decision at which it has arrived respecting M. Vincenzi, that he should be awarded an honorary medal in consideration of the important labours which he has so successfully completed.

"The academy unanimously, after the result of a private voting, awarded to M. VINCENZI an HONORARY MEDAL for his new system of working Jacquard's loom.—Agreed to."—*Report made in the name of the Commission of the Academie des Arts et Manufactures de Paris, by M. J. Slivie, 5th July, 1858.*

## SECTION B.

### MACHINES AND TOOLS USED IN VARIOUS WORKS.

#### 1234.—13. BOUGLEUX, F., *Leghorn.*

Millstones of double thickness, formed of nine pieces of quartose rock from Tuscany.

Price in London £24 the pair. (See Class I., No. 178.)

#### 1235.—1030.\* CAMPI, GIUSEPPE, *Bellosguardo (Florence).*

Machine to grind steel points for engraving tools.

It produces excellent points, which wear well.

#### 1236.—1123.\* CONROTTO, CELESTINO, *Turin.*

Machine for packing silk.

Apparatus for killing the silkworm chrysalis.

#### 1237.—1037.\* DEI, FRANCESCO, *Florence.*

Brass and wooden block for printing cotton stuffs and handkerchiefs.

Machine to print madapolams for dresses or handkerchiefs.

Price of madapolam machine, for dresses (in copper) £4.

Price of the handkerchief machines (in wood) £2 8s.

#### 1238.—1054. LANCIA, GIUSEPPE, *Turin.*

Chopping board.

Apparatus for chopping meat and sausages. (See Class III., No. 531.)

#### 1239.—1062. LEVINSTEIN AND *Co., Milan.*

Apparatus for glazing dyed silks.

The difference between this implement and those in general use by dyers, consists in this, that the silks, before being stretched by means of suitable machinery, are now no longer immersed in a bath, but are impregnated with steam introduced by a pipe which runs along the machine. This machine is very simple, and so effective that it may be used to glaze 200 kilos. of silk per day, and the silk then acquires a greater brilliancy, without losing any of its softness, and without any detriment to the colours which have been applied to it.

**1240.**—71.\* MASSOLENI, MARIANO, *Genoa*.

Millstones, of 4½ feet diameter, the fixed stone made of 16 pieces of Ferté stone; the other, the revolving stone, of 16 pieces of Lesigny stone. (See Class 1, No. 180).

**1241.**—1057. PEREZ, CAMMILLO, *Lanciano (Chieti)*.

Model of a floating flour mill; with a current of one foot per second,

it has the power of three horses, sufficient to turn one of the two mill stones.

**1242.**—1040. RICCI, RANIERI, *Leghorn*.

Carpenters' tools.

**1243.**—1040.\* ROSSI, PASQUALE, *Arezzo*.

Articles in wood, measures, moulds, buttons, &c., for common use.

**1244.**—1038.\* TREVES AND PAVAN, ANTONIO, *Pavia*.

Universal worm for making iron screws, of whatever length.

**1245.**—1041. VEROLE, PIETRO, *Turin*.

Chest of carpenter's planing tools.

## CLASS VIII.

### MACHINERY IN GENERAL.

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The founderies and machine factories of Liguria are such remarkable establishments, and produce such important objects, that we may safely pronounce Genoa and its neighbourhood to be the chief seat of this mechanical industry in Italy. The great development of railways and of steam navigation, both for the mercantile and royal navy, will undoubtedly secure the permanence of these undertakings. During the last three years the government has availed itself of private establishments, as auxiliaries to the arsenals, in the making of cannon and projectiles, for the construction of engines and boilers for the navy, &c. This industry, being auxiliary to so many others, would necessarily be greatly aided by the repair of engines and machinery.

The most extensive of these establishments is that of San Pier d'Arena (Ansaldo and Co.), of which we have already spoken in the fifth class; next in order is that of Robertson, whose business is continually increasing. This firm makes machines, turbines, steam engines, mills, &c. Two hundred and thirty workmen are there employed, as well as a steam-engine of twenty-five horse-power. They consume six hundred tons of pig-iron and fuel, consisting chiefly of Cadibona coal. (See Class I., Sec. 4.)

At Porta Pisa there is the old establishment of Orlando, with a ship-building yard. The value of its business is about £24,000 annually; it constructs brick-making machines, vermicelli presses, towing vessels, marine steam-engines, iron bridges, dredging boats, with moveable keels for deepening harbours, &c. There are three hundred workmen and a sixteen horse-power engine.

Westermann, Brothers, employ 150 workmen in their manufactory at Sestri Ponente; they manufacture turbines, steam-engines, &c.

Balleydier, another eminent civil engineer, especially makes castings at his establishment at San Pier d'Arena; but he also constructs and repairs machines, &c. He employs 200 workmen, consuming about 450 tons of pig-iron and fuel; the value of the articles he produces being £20,000 annually.

Molinari, at his factory, on the Bisagno, chiefly constructs corn mills. He also makes various implements, winnowing and thrashing machines, bolting cloths of a new shape, turbines, and steam engines. A steam engine of fifteen horse-power sets in motion the machinery and ventilators of the foundry. His articles are exhibited in Class XI.

In the city of Turin, Decker, Brothers, employ more than a hundred workmen in the manufacture of hydraulic presses, water-closets, &c.

Huguet's establishment, founded about six years ago, makes turbines, hydraulic engines, wheels, mills, steam engines and boilers, presses for *pâtes*, printing presses, machines for silk-weaving, paper-making, &c.

Calla's factory employs 200 workmen. The foundry constructs manufacturing machines, especially for the government railways, and for the manufacture of the national arms at Valdoco, &c.

Hydraulic machines are very numerous in Lombardy, as might be supposed, if we reflect upon the riches which that country derives from its very abundant water supply, and from the traditional skill with which it is distributed for the wants of irrigation, navigation, and

industry. In Milan alone there are 26 factories, of different sizes, for the construction of hydraulic machines; there are 32 others throughout the province, with 180 workmen, who receive daily wages of 1s. 3d. to 2s. 1d.

Irrespective of boilers and steam engines, these establishments turn out hydraulic wheels, turbines, axles, girders, pulleys, cog-wheels, and hydraulic presses for making *pâtes* and candles, wine presses, pumps for draining valleys and marshy lands, as also irrigating machines.

The establishment of Bouffier, of Milan, besides various implements, manufactures a very ingenious apparatus for extracting gas from peat, destined chiefly for lighting private houses.

Suffert's factory is specially appropriated to the manufacture of the multifarious implements required by the silk trade.

The largest factory of machines at Milan is that of Schlegel and Co., established about a dozen years ago. Although it has suffered from the heavy import duties upon British iron, it has nevertheless succeeded in continually developing its manufactures. They construct all kinds of machines, but especially the great hydraulic wheels for cotton mills. Four perform the work of the foundry. There are 400 workmen employed in it, and a steam engine of 24 horse-power.

Bortolon and Co., at Treviso, have recently opened a factory, well provided with tools and implements suited for very important and special work; it employs 200 workmen, and has at its command machinery of 200 horse-power.

The factory, founded in 1847, has recently extended its operations, and undertakes important castings and steam engines up to forty horse-power.

At Padua there is an establishment of some importance, under the firm of Benech and Rocchetti, for the construction of iron bridges, steam engines, and apparatus of every kind.

The establishment of Palazzi has two cupolas, eight forges, and various engineering machines. All kinds of apparatus are made there.

At Venice, MM. Bauffier and Faido have a manufacture of gas apparatus, which supplies the towns of Venice, Padua, Vicenza, Treviso, and Udine. They also manufacture stoves and hydraulic pumps.

M. Pegonetti has introduced into Venetia the manufacture of lead pipes made without soldering, and of any length, a branch of business becoming very important, on account of the numerous uses to which these pipes are applied. He uses the hydraulic press invented by Sieber, in 1829, since improved, and manufactures pipes of a very considerable diameter.

At Trieste, the Brothers Strudhoff have established an engineering factory, having four hundred workmen, and turn out steam engines and other machines and apparatus, for marine purposes, for agriculture, and general industry.

At Bologna there are three factories and foundries. The first dates from 1838, superintended by M. Reatti; it is well fitted up for the casting of large articles. The second, founded in 1840, belongs to the firm of Calzoni. They make stoves, furnaces, presses for oil and *pâtes*, agricultural machines, &c., and above all candle moulds made of a composition of various metals, the trade of which is so considerable that they work up fifteen hundred to two thousand kilos. daily.

The establishment of Castel Maggiore, with one hundred and fifty workmen, is still more important. It has a water-power of eighteen horses, obtained from a neighbouring canal. The foundry is extensive; it contains two cupolas, which can be charged with from one thousand to twelve hundred kilogrammes, and crucibles for the melting of metals, &c. The products of this factory are hydraulic and agricultural machinery, mining implements, sleepers, pulleys, fly-wheels, mill-work, &c. The dredging machine at Ancona, of 25 horse-power, was constructed at these works.

Baldantoni, Brothers, of Ancona, employ more than 120 workmen making looms for steam silk-weaving machines, boilers and electrical machines, hydraulic machines, scales and steel-yards, machinery for currying hides, agricultural implements, &c.; these last appear in the name of their exhibitor (Class IX.), as well as the tools and agricultural implements of Meleto, which are highly valued in Tuscany. They have turned out numerous excellent articles, particularly the Ridolfi ploughs, mowing machines, harrows, hoes, root-cutters, grubbers, horse-mattocks, sieves, winnowing-machines, presses, grain-crushers, flax-cutters, &c.

Among the foundries, that of Follonica (see Class I., No. 26) produces many excellent objects, equally useful and ornamental, amongst which are stoves, economical ranges, &c. It produces also chairs for railroads, large gas-pipes, and large cylinders for paper-mills.

Another foundry was established in 1841, at Pignone, near Florence, by Messrs. Benini and Michelagnoli; it makes excellent stoves, straw-cutters, &c.

At the Florence workhouse are made cast-iron articles equal to those of the manufacturers of whom we have just spoken. At Pisa, Lucca, and Leghorn there are five foundries of this kind.

The manufacture of leaden pipes without solder is very active in Tuscany, especially in the manufactory of M. Bujard, at Leghorn, and of M. Mazzoni, at Prato.

At Palermo, Antonio Lopresti manufactures agricultural implements, such as the Dombasle plough for steep land, Scotch ploughs for deep clearing, presses, &c.

At Naples, S. Lutzenkirchen makes pumps, and the Brothers Vaemons construct many Jacquard looms and rag-tearing machines.

The old established factory of Messrs. Zino, Henry, and Co., manufactures pumps and hydraulic machines, for dressing wool, agricultural purposes, &c. These are worked by small but ingeniously contrived steam-engines.

In Southern Italy the most important of these establishments is that of Pietrarsa, which has already been mentioned in Class I. At present arrangements are being made to convert it into a military arsenal, for the use of the artillery corps.

When the great military levies now necessary shall have been obtained, doubtless industrial manufactures will be greatly developed in the Southern Italian provinces, where the raw material is very cheap, as well as labour, and where the men are thoroughly sober and intelligent.

**1246.**--1050. BERNARD, AUGUSTO,  
*Naples.*

Reflectors for lighthouses.

**1247.**—1051. BORELLA AND  
BOANO, *Asti.*

Model of shopfront.

**1248.**—1168.\* BRUNETTI, GIUSEPPE, *Florence.*

Model of a mechanical staircase.

**1249.**—1052. CORTI, DOMENICO,  
*Milan.*

Portable hydraulic pump.

**1250.**—1036.\* CIANFERONI,  
ANGELO, *Florence.*

Block for printing oil cloth.

**1251.**—1053. FUSINA, VINCENZO,  
*Pavia.*

Machine for filling up wheel-ruts.

Machine for clearing away snow from streets.

Machine for communicating motion to different points in different directions.

Model of piles under water to sustain the scaffolding of bridges.

**1252.**—1061.\* GAUTHIER, AGOSTINO, *Turin.*

Machine for corking bottles.

**1253.**—1001. GRIMALDI, FILIPPO,  
Rotatory steam boiler.

These boilers consist of a common cylindrical body, fitted up, and resting upon supports by means of trunnions fixed at its ends. A boiler can contain flues, and be full or half full of water. Upon almost its whole length it is enclosed in the fireplace, the remainder resting on the chimney, so that the fire and the flame play over the whole of its surface, pass over the flues which cross it completely, and thus escape into the chimney. The entire boiler being an evaporating surface, and being able to contain twice the quantity of flues, the weight of the whole may be reduced to a fifth, and the expense of the first manufacture is not more than two-thirds for boilers of more than 15-horse power. Moreover, as it is a physical fact that the agitation of a liquid renders it more easy of penetration by heat, it follows that, with a given heating surface, this boiler will convert the water into steam more readily than any other. The inventor asserts that by the rapidity of vaporization, the superheating of the steam, and the small volume of the boilers, there is a saving in coal of 30 per cent. The boiler is constructed for the highest pressure; its incessant revolutions prevent its being injured by the heat, whatever may be the level of water in the inside. It is easy to take to pieces for inspection, inasmuch as it is not built into the masonry. The inventor proves that it is impossible for this boiler to become incrustated, or to corrode, especially in marine engines, where the opening for the passage of the steam is protected by several rows of tubes, which, converting it into steam, stop the water thrown against them. Messrs. Hancock and Sons, Fenson Foundry, Staffordshire, are the makers of these boilers.

**1254.**—1063.\* TURIN (GENERAL  
POSTAL ADMINISTRATION).

Two letter-boxes in use in Italy, in which the postman cannot see or touch the contents.

#### Post-bag.

In order to answer its purpose, the letter-box should have nothing inside which would diminish the space appropriated to the letters, or obstruct their free and easy passage when they are taken out. It was requisite to discover a means whereby the box could be opened without the intervention of the postman, and the bag be closed, so that the postman in charge could not open it upon the road. It was further necessary that the lid of the bag should be as light as possible, and the mechanism arranged to work in such a way that every time the box was closed a change should be made in the indication of the hour, so as to make a counter check of the whole operation, upon a paper fastened to the cover of the bag, and thereby serving as a proof that his duty has been punctually performed.

These different requisites are fulfilled in the two boxes exhibited by the General Administration of the Post-office. In one, made from the invention by M. Raffaele Turchini, of Florence, it is sufficient to slide the bag into the grooves in the lower part of the box, and to push it hard to the end, when all the contents of the box will fall at once into the bag.

No sooner is the bag withdrawn, than everything resumes its normal position—the bag, as well as the box, remaining closed. A bell warns the postman the moment the bag has reached the extreme point it ought to go, and the bag, on its withdrawal, receives a dry stamp, proving that the bag has been emptied at the hour appointed. No letter can remain behind in its passage, or be damaged in the receptacle, to which a good capacity and considerable width have been very judiciously given.

The mechanism adopted furnishes, moreover, complete security as to the closing, seeing that there are no means of opening the bag independently of the box, or *vice versa*. It affords also a certainty that the indication of the hour has been marked afresh, and prevents any possibility of the postman forgetting the key of the box. The lightness of the bag, weighing only four pounds, its neatness, and substantial make, as well as its cheapness, cannot be too much approved. Each box costs only 135 francs, together with the bag in charge of the postman, who has to attend to six boxes.

This box has obtained for M. Turdini, at the Exhibition at Florence of 1861, for the before-mentioned considerations, a medal.

In the other, which in truth differs but little, the messenger who collects the letters

in the box places his bag in two grooves near the lower part of the box, the bottom falling with a key; a bell announces when the bottom of the box is turned out. In taking out the bag, the bottom of the box is made to close, and at the same time the indication of the time for the public is changed as requisite. A number placed inside the box is printed on a piece of paper, previously fastened to the cloth of the bag, this number indicating whether the collector has punctually fulfilled his duty. All these operations do not occupy more than a minute.

With the post-bag closer, which can be applied to any bag, the latter can be opened without a key with the greatest promptitude, and with remarkable facility. The contents of the bag are safe, because it cannot be opened without tearing the slip of paper fixed in the buckle of the strap, and on which the seal of the transmitting office and the date of the transmission are affixed.

#### 1255.—1060.\* ACQUADIO, BERNARDO, *Biella*.

Apparatus for the making of fire-works.

#### 1256.—1055. MACRY, ENRICO, AND Co., *Naples*.

Steam engine cylinder.

#### 1257.—1056. MURATTI, ANNIBALE, Colon. Director of the Royal Iron Works, *Naples*.

Model of a crane with cog-wheels.

#### 1258. — 1058. PIETRARSA (ROYAL IRON WORKS), *Naples*.

Shaft for marine steam engine of 450 horse-power.

Steam case and admission valve for ditto.

Wrought-iron connecting rod for ditto.

Bronze toothed wheels.

#### 1259.—1044. SOMMELIER, GRANDIS, AND GRATTONI, *Turin*.

Machinery employed in making the tunnel through Mont Cenis (drawing).

Topographical map and section of Mont Cenis, indicating the line of railway.

This machinery is in use for piercing the Alps at Modane, and Bardonnèche, near Mont Cenis, the object of which is no less than to establish communication between Italy and France, by means of a tunnel, of the enormous length of 12 kilometres, which has to be cut through from the extremities only, without having recourse to shafts. Those who are acquainted with these undertakings will be struck with the boldness of the project, from the immense difficulties which have to be surmounted in so short a time. Without alluding to other obstacles, the machinery for accomplishing so extraordinary a work must fulfil a three-fold requisite; to make, in as short a time as possible, the largest amount of excavation; to maintain the salubrity of the air in spite of the continual explosions of powder and other causes of foulness, in a tunnel of great length without any opening; and to keep the air in such a temperature as would not render the working either very painful or altogether intolerable.

The machinery has fully answered those important conditions, by the simple employment alone of compressed air, of different degrees of density. This air, transmitted from the outside, furnishes the motive power necessary for the boring machines, which act with such regularity that it might be imagined that they were worked by hand labour. After having served this purpose, the compressed air escapes to the bottom of the tunnel, taking the place of the vitiated air which it meets with and its action is sufficient to drive it out through the opening of the tunnel. Moreover, this compressed air, when expanding at the bottom of the tunnel, absorbs the super-

abundant heat, and maintains the ventilation in its normal condition.

**1260.**--1119. STAFFUTI, OSVALDO, *Pesaro*.

Large machine for corking bottles of all sorts.

**1261.**—1064.\* TEODORANI, SEBASTIANO, *Forlì*.

Lever of the first order, newly invented arrangement.

This apparatus is composed of a train of combustible substances, enclosed in a tube, which is perforated in the sides, and thus arranged round the article or building subject to fire; and a small detonating ball is placed at the end of the train; when the fire breaks out, it heats the string, the latter acts like a common match, and causes the explosion of the ball, which at once gives the alarm.

**1262.**—1065.\* TOVO, FRANCESCO, *Turin*.

Apparatus for giving alarm in case of fire.

**1263.**—1066.\* TURCHINI, RAFFAELLO, *Florence*.

Letter-box which the postman opens without seeing or touching the contents.

(See General Administration of the Posts, No. 1254).

(See, for machines used in the manufacture of hemp, flax, cotton, &c., Classes XVIII., XIX., &c.)

## CLASS IX.

### AGRICULTURAL AND HORTICULTURAL MACHINES AND IMPLEMENTS.

Italian agricultural machinery has been, even in our own Exhibitions, but imperfectly represented. In fact the articles exhibited by M. Colli, of Novara; by Gutter and Gunter, of Intra; Aglietti, of Vercelli; Gauthier, of Turin; Balleydier, of Sampierdarena; Andiffredi, of Mondovi; Rumele, of Milan; and several others, gives but little idea of the importance and general production of the respective houses who sent them, or the extent and variety of machinery usually employed in Italian agriculture.

In many parts of Italy old-fashioned implements are still in use, while in others improved machinery, either manufactured on the spot or imported from abroad—in some instances modified to suit particular circumstances—have been introduced.

The ploughs of Dombasle and those of Sambuy, in Northern Italy, and also in the Sardinian and Bolognese provinces, have almost completely superseded the old common plough; those of Sambuy—peculiarly adapted for deep and tenacious soils—are generally preferred to those of Dombasle.

In Tuscany, the Ridolfi, Lambruschini, and Digny ploughs are greatly increasing in number; and in the Neapolitan territory, in the Marshes, and in Umbria, other and various kinds of ploughs are introduced, according to the nature of the soil.

Valcourt iron harrows, manuring machines, scarifiers, rollers, clod-crushers, straw-cutters, root-slicers, leaf-cutters, improved churns, threshing machines of various forms, winnowing machines, seed-crushers, Indian corn-hoppers, mechanical and hydraulic presses for wine and oil, a complete series of machines and implements connected with the culture of hemp, flax, and rice are common. For the rearing of silkworms various appliances have been adopted in the ancient provinces of the kingdom, in the Valley of the Po, and in Tuscany; and being in use by the more intelligent proprietors, doubtless they will soon become general in the Marshes, in Umbria, Naples, Sicily, and Sardinia.

These implements are made principally by the above manufacturers, and by others more or less eminent, who have been enumerated in the summary list of Class VIII., but many are made by small manufacturers in villages.

Great numbers of threshing machines for rice or corn, set in motion by water; and dressing machines to clean rice—chiefly made in Vercelli, Novara, and Milan—are met with in all parts of the well-irrigated provinces of the north of Italy; and the very cheap and well known turbines of the engineer Barberis de Mondovi are employed to set in motion threshing, winnowing, cleaning machines, &c.

Drain pipes, by Whitehead and Bizot's machines, are made at Turin, by the firm of Gauthier. Steam locomotives are also very much applied to agricultural purposes in Piedmont, Lombardy, Emilia, Tuscany, and Naples.

The articles destined for the Exhibition of London, and indicated in the present Catalogue, may be divided as follows:—

A.—Implements for cultivating land, drawn by animals.

B.—Implements for cultivating land by hand-labour.

The articles comprised in these categories are not different from those of other countries, except in some minor varieties of a local and often of a very questionable character. This last observation does not apply to the modifications in the plough of Sambuy, Lambruschini, Ridolfi, and others, in its reverse curve.

C.—Cutting implements.

D.—Distributing implements.

With the exception of bellows, pincers, brushes, &c., to spread sulphur on the vines and mulberry trees, and some rare machines for sowing and for making hay, whether imperfect,

or in imitation of those from abroad, the making of that class of implements and their employment is very imperfectly developed in Italy.

E.—Waggons, carts, &c.

They present nothing particular; only the building of cars and waggons is of good and solid character.

F.—Implements for manipulating produce.

These articles are sufficiently numerous, varied, and extensive, in Italy; we have reported in Class VIII., the machines of Staffuti, of Pisaro, for corking bottles, and further that of Gauthier of Turin, both simple and substantial, which give the same results at a less cost. We must not omit the presses and large looms of Lombardy and Piedmont.

G.—Materials employed in the rearing of animals.

There are a great number of apparatus for rearing silkworms. That of Dr. Delprino de Viseme, Piedmont, is one which is most perfect in this art. With respect to the others they require no particular mention.

H.—Materials for irrigation and drainage.

Drainage is not sufficiently represented in the Exhibition by the pipes of M. Atenolfi (Class X.); for this practice has been much developed in Piedmont, where it has been applied over an extent of 5,000 hectares, with a new intermittent method suggested by MM. Bizot and Gauthier, the engineers, who have tried it in the rice fields of M. Le Comte di Cavour.

The 5,000 hectares referred to have been drained under the direction of M. Gauthier, the partner and successor of M. Bizot, who has established eighteen manufactures of drainage pipes. But the systems represented in London do not furnish even an approximative idea of the successful method followed in many parts of Italy.

I.—Materials used in the cultivation of hemp. (See Class XIX.)

#### A.—IMPLEMENTS FOR CULTIVATING LAND, DRAWN BY ANIMALS.

**1264.**—1080. BACCIOLANI, LOTTARIO, *Modena*.

Jointed harrow, pattern No. 1.

Do. do. do. No. 2.

Do. do. do. No. 3.

**1265.**—1083. BERTELLI, G., *Bologna*.

Plough for deepening the furrow of the common plough (*aratro ravagliatore*). (See Class XIX.)

**1266.**—1090. CERTANI, ANNIBALE, *Bologna*.

Plough for deepening the furrow, like the preceding (*aratro ravagliatore* Certani). (See Class XIX.)

**1267.**—1091. CIAPETTI, BENEDETTO, *Florence*.

Tuscan cast-iron plough, with apparatus.

*Ruspa* with chain, for carrying earth.

Thrashing machine, for maize.

Valcourt's harrow, with apparatus.

Straw cutter.

Woodman's saw for large branches.

Pruning knife for cutting small branches.

**1268.**—1093. DE CAMBRAY-DIGNY, GUGLIELMO, *Florence*.

Grubbing plough.

Small summer plough.

**1269.**—1096. DUINA, ANGELO, *Brescia*.

Ploughshare.

Scythe.

Spade.

Forks.

**1270.**—1099. FISSORE, GIOVAN BATTISTA, *Alessandria*.

Dombasle plough, complete.

**1271.**—1101. GIUNTINI, OVIDIO, *Peccioli (Pisa)*.

Cast-iron Ridolfi plough, modified.

Modified wrought-iron American plough, by Leak.

Common Tuscan deepening plough (*aratro ripuntatore*), wrought-iron, modified.

- 1272.**—1126.\* MUSSIARI, GIROLANO, *Parma*.  
Sub-soil plough, from Parma.
- 1273.**—1114. ROSSI, ALESSANDRO, *Bologna*.  
Clod-crusher. (See Class XIX.).
- 1274.**—1084. BERTONE DE SAMBUY, General EMILIO, *Turin*.  
Three Sambuy ploughs.
- 1275.**—1117. SPANO, LUIGI ORISTANO, *Cagliari*.  
Agricultural cart.  
Plough.
- 1276.**—1118. SPINA SANT'ALOI, PIETRO, *Aci Reale (Catania)*.  
Plough share.
- 1277.**—1119. SUPERCHI, PIETRO, *Parma*.  
Sub-soil plough for a clayey soil.
- 1268.**—1087. BOTTER, LUIGI, *Bologna*.  
Implements and tools for hemp-working. (See Class XIX.).
- B. IMPLEMENTS FOR CULTIVATING LAND BY HAND-LABOUR.**
- 1279.**—1100. GELLI AND DELLE PIANE, *Pistoja*.  
Scythe.
- 1280.**—1103. JACUZZI, GIOVANNI BATTISTA, *Pistoja*.  
Scythe.
- 1281.**—1105. LEOLI, NICCOLÒ, *Brescia*.  
Spade.  
Shovel.
- 1282.**—1110. MORI, GAETANO, *Greva (Florence)*.  
Two-toothed fork.
- 1283.**—1112. PASQUI, GAETANO, *Forlì*.  
Instrument for fixing poles.  
Instrument for extracting poles.  
Hoe.  
Double-edged hoe.
- 1284.**—1116. SANTINI, LUIGI, *Fucecchio (Lucca)*.  
Great hoe.  
Spade.  
Spade of another sort.
- 1285.**—1120. TORELLI, DANIELE, *Lucca*.  
Spade.  
Shears.
- C. CUTTING IMPLEMENTS.**
- 1286.**—1121. VAIRO, GIUSEPPE.  
One horse-power reaper.
- D. DISTRIBUTING IMPLEMENTS.**
- 1287.**—1088. CAMBINI, ENRICO, *Florence*.  
Bellows for sulphuring vines.  
Tweezers for do.
- E. WAGGONS, CARTS, &c.**
- 1288.**—899.\* CAGLIARI (SUB-COMMITTEE OF).  
Variously worked straw panniers.

**1289.**—1117. SPANO, LUIGI ORIS-  
TANO, *Cagliari*.

Rush panniers.

**1290.**—1122. VIDA, FRANCESCO,  
*Codogno (Lodi)*.

Cart for carrying produce on soft  
ground.

F. IMPLEMENTS FOR MANIPULATING  
PRODUCE.

**1291.**—1081. BALDANTONI,  
GIOVAN BATISTA, AND BROTHERS,  
*Ancona*.

Thrashing machine for Indian corn.  
Wine press.

Straw-cutting machine.

Bottle-corking machine.

**1292.**—1082. BARGIONI, GIU-  
SEPPE, *Florence*.

Hempen string bags, for expressing  
olive oil.

Rush bags for the same purpose.

Hempen twine, for tying the bags  
under the press.

Iron matting used in the presses.

**1293.**—1086. BORELLO, SECONDO,  
AND BOANO, ANDREA, *Asti*  
(*Alessandria*).

Wine-press, made of wood, with  
iron screw working to the right  
and left.

**1294.**—1092. CROSETTI, PIETRO,  
*Asti (Alessandria)*.

Wine measures.

**1295.**—1095. DELLA BEFFA,  
GIACINTO, *Genoa*.

Thrashing machine.

**1296.**—1094. DE FASSI, FEDERIGO,  
*Milan*.

Drawing of a circular rice-cleaning  
machine.

**1297.**—1124.\* FUSINA, VINCENZIO,  
*Pavia*.

Thrashing machine for maize.

**1298.**—1102. GUPPY AND PAT-  
TISSON, *Naples*. (See Class I.,  
No. 55.)

Hydraulic presses for the extraction  
of olive oil.

Screw-press for the same use.

**1299.**—1125.\* LUCHINI, GIU-  
SEPPE, *Florence*.

Copper churn.

**1300.**—1108. MARCHI, LEOPOLDO,  
*Volterra (Pisa)*.

Machine for compressing faggots of  
small wood.

**1301.**—1113. PIZZARDI, Marquis  
and BROTHERS, *Bologna*.

Machine for chopping up horns and  
hoofs for manure.

SUBSTANCES USED IN THE REARING OF  
ANIMALS.

**1302.**—1096. DELPRINO, MI-  
CHELE, *Vesime (Alessandria)*.

Separate system for silkworm breed-  
ing.

Machine for opening the cocoons.

Do. do. separating the moths.

Do. do. separating the eggs.

Do. do. compelling the moths  
to deposit the eggs in a given  
space.

Slip of linen for separating the eggs.

**1303.**—1107. MAFFEI, Niccolò,  
*Volterra (Pisa)*.

Model of beehive.

Beehive, simple.

Beehive, double.

Beehive, in three compartments.

**1304.—1115. SAJNO, FRANCESCO,**  
*Milan.*

Newly invented machine for hatch-  
ing silkworms' eggs.

**H. MATERIALS USED IN IRRIGATION,  
DRAINAGE, &c.**

**1305.—1165. ATENOLFI (Prince  
of CASTELNUOVO), Naples.**

Drainage pipes.

**1306.—1089. CASUCCINI, PIETRO,**  
*Sienna.*

Level for land-surveyors.

Water level, with moveable slides.

**1307.—1097. FAA DI BRUNO,**  
*Alessandro, Alessandria.*

Stick made to serve as level, plumb-  
line, measure, &c., in field labour.

**1308.—1104. KRAMER, EDOARDO,**  
*Milan.*

Models illustrating the Lombard  
system of farming and irrigation  
of land.

The models Nos. 1, 2, 3, 4, and 5, re-  
present the different arrangements made in  
Lombardy in the winter meadows, (*marcite*),  
according to the natural declivity of the land  
and the quantity of water available.

Nos. 1, 2, 3, and 4 are made upon a scale  
of 1 to 100 for the horizontal distance, and 1  
to 20 for the elevation: this difference was

necessary to show the slopes of the different  
parts of the meadow.

The essential elements of every artificial  
meadow are:—A main canal to convey the  
water to the highest parts of the meadow;  
secondary irrigatory canals which distribute it  
over; square plots of sloping ground; small  
ditches, which serve for carrying off the water  
which has not been absorbed during the irriga-  
tion; and, lastly, a main canal, in which all  
the small canals discharge themselves.

Model No. 6 represents, upon a scale of 1  
to 10, a small sluice of oak, such as is used in  
Lombardy for the distribution of the water.  
To complete the description of these winter  
meadows, we have added a small shovel, used  
in the work; and a bundle of grass cut in the  
month of February, and a bundle of hay cut  
in the month of July, from the same meadow.

The artificial meadows irrigated during the  
winter usually yield seven crops a year; there  
is one near Milan which has given nine.

The drainage arising from the sewers of  
London and other great cities might be bene-  
ficially utilized for the establishment of  
artificial meadows; the damp and temperate  
climate of England would be favourable to  
them. A lithographed memoir is added to  
the models just referred to, which gives  
some general notions about the method  
of preparing the meadows, their productions,  
and advantages; it also contains a description  
of the models exhibited.

**1309.—1109. MILAN (ROYAL LOM-  
BARD INSTITUTE OF SCIENCE,  
LITERATURE, AND ART, OF).**

Model of outlet of the waters of  
the Milanese canals.

**I. MATERIALS USED IN THE CULTI-  
VATION OF HEMP.**

(See Class XIX.)

## CLASS X.

### CIVIL ENGINEERING, ARCHITECTURAL AND BUILDING CONTRIVANCES.

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If an opinion were asked respecting the classification of the International Exhibition, it could scarcely be given, unless accompanied by the observation, that the articles comprised in Class X. properly belong to one or other of several classes.

In fact we run risk of being involved in confusion when we have to consider the origin of certain articles and the uses to which they are destined.

It is necessary to direct attention to this fact, and to appeal to experience, and to the Commissioners, whether the difficulty—or to speak more correctly—the utter impossibility of assigning numerous articles to one particular class—to which properly they may for some reasons appertain—without at the same time excluding them from another class, to which they might be assigned for more or less satisfactory reasons.

It is indeed certain, that if, viewed relatively to their origin, we should desire to give a preference to one class over another, it is the origin which in an industrial point of view ought to be preferred with a view to determine the proper position of the articles exhibited.

Class X. might be increased with industrial products both numerous and diversified, which are used by artificers, architects, builders, and civil engineers.

Complaints which may be urged against every kind of arbitrary classification, are really more applicable to Class X. than to any other; and it is much to be wished that this should, as much as possible, be taken into consideration at a future period. This is the reason why Class X. in particular, does not present one-fourth of the exhibitors it would contain if Italian architects had imagined it possible that this class was open to receive designs and models of their works.

In addition to this we must add, that Italian architects and builders have not had leisure to collect and to exhibit their designs, and inventors are too much occupied at this moment in works undertaken on account of the novel position of the country, and the changes which are in progress of being accomplished. However, in acceding to the arrangements which constitutes Class X., with the three sub-classes, such as they have been determined upon, we will endeavour to marshal, as fairly as possible, the various articles presented, at the same time remarking that many of the articles, as well as the exhibitors, either with a desire to keep together remarkable collections, or on account of uncertain application of some articles as regards the classification, have found their position in Class I., and especially amongst the articles in Section V., which, to carry out a reasonable arrangement, has been made in that class. (See page 44 et seq.)

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## SECTION A.

### WORKS OF CIVIL ENGINEERING.

§ 1. TRIANGULATIONS, DRAWINGS, PLANS, MARITIME CONSTRUCTIONS, &c.

**1310.**—2289.\* **TURIN** (ROYAL  
DIRECTION OF THE CADASTRAL  
SURVEY OF).

Collection of acts and documents  
relating to the Permanent Census  
of the old Italian provinces.

Note on the regulations made for this operation, and on the system adopted to carry them into execution	...	...	...	...	...	1
Lectures given at the Landholders' schools ( <i>scuole censuarie</i> ), instituted by decree of Count Cavour, dated 25th August, 1853:—						
Mémorial upon the documents required, and their preservation, by Ant. Rabbini, chief director of the office	...	...	...	...	...	2
Atlas of planimetric drawings, relating to the preceding memoir	...	...	...	...	...	3
Elementary geodesy, by M. Pietro Myu	...	...	...	...	...	4
Landholders' tax, by Professor Giuseppe Borio	...	...	...	...	...	5
Discussions in the Chamber of Deputies on the State Survey Bill	...	...	...	...	...	6
Do. Chamber of the Senate	do.	do.	...	...	...	7
Collection of instructions relating to the permanent survey, published up to the end of December, 1856, Vol. I.	...	...	...	...	...	8
Do. up to the 1st April, 1858, Vol. II.	...	...	...	...	...	9
Do. " 5th April, 1860, Vol. III.	...	...	...	...	...	10
Do. " December, 1861, Supplement	...	...	...	...	...	11
General index of subjects contained in the four preceding volumes	...	...	...	...	...	12
Addenda to the Ministerial instructions contained in Vol. I.	...	...	...	...	...	13
Addenda to the Director-General's circulars, contained in the Vols. II. and III., and in the Supplement	...	...	...	...	...	14
Summary of the surveying operations, presented to the Chamber of Deputies by the Minister of Finance:—						
A. Survey of the 9th March, 1857, printed	...	...	...	...	...	15
B. " 13th May, 1858	...	...	...	...	...	16
C. " 27th June, 1861	...	...	...	...	...	17
D. " 13th March, 1862	...	...	...	...	...	18
Complete collection of surveying documents relating to the district of Gassino:—						
Trigonometric group of the environs of Turin, photographed	...	...	...	...	...	19
Triangular group of the district of Gassino, photographed	...	...	...	...	...	20
Trigonometric triangular group	...	...	...	...	...	21
" " " photographed to	...	...	...	...	...	19
Trigonometric rectangular group, to	...	...	...	...	...	20
" " " photographed to	...	...	...	...	...	21
Co-ordination of various trigonometric points	...	...	...	...	...	22
Trigonometric calculations of the communal group	...	...	...	...	...	23
State of the co-ordinated rectangles	...	...	...	...	...	24
Mapping canvas to on transparent cloth	...	...	...	...	...	25
" " to photographed	...	...	...	...	...	26
Territorial lines to on transparent cloth	...	...	...	...	...	27
" " to photographed	...	...	...	...	...	28
Configuration of the territorial lines	...	...	...	...	...	29
Plan of uniting the leaves of the map	...	...	...	...	...	30
" " of the circumference	...	...	...	...	...	31
Reduction of the map to in photography	...	...	...	...	...	32
Original map to, sheet 10	...	...	...	...	...	33
Cahier of local indications, section 21	...	...	...	...	...	34
Cahier of local elevations, section 21	...	...	...	...	...	35
Configuration of section 21, sheet 4	...	...	...	...	...	36
List of real property, section 21	...	...	...	...	...	37
Alphabetic catalogue of landowners, section 21	...	...	...	...	...	38
List of the maps of section 21	...	...	...	...	...	39
Copy of section 21, on transparent cloth, with indications of the directions in which it has been surveyed	...	...	...	...	...	40
Copy of the annexe representing the district of Gassino, to a scale of	...	...	...	...	...	41

This collection will give an exact and complete idea of the remarkable work in which the government of the old kingdom of Sardinia was formerly engaged, and which it confided to the superintendence of a distinguished geometrician, M. Antonio Rabbini, to whom is due the merit of having originated the undertaking and the labour of practical

surveying by means of which it has been conducted.

Intelligent men, who place themselves in the same position as the Italian Government, and who will examine the collection of documents above mentioned, cannot but form a high opinion of the work undertaken, and recognise that it accomplishes with rare per-

fection all the requirements of a definitive survey. We do not exaggerate in affirming that of all works of this nature, this is, technically and correctly speaking, the most complete.

With a view of giving an exact idea of the principles which suggested it, and which have guided its execution, we think we may appropriately transcribe here that which has been published elsewhere:—

“Without aspiring to the formation of a complete territorial register (*cadastro probante*) which cannot be obtained but by long and expensive formal proceedings, it was desirable to produce an exact record of the position of the lines of demarcation and configuration of the territories, districts, and private properties in the country, so that by means of trigonometrical posts, exactly determined and preserved on the lands, with the aid of numerical references entered in special registers (*cahiers*), the exact position of the above lines might be at all times ascertained, and even pointed out on the spot, if required.

“With this object a system of elevations was made choice of, which were obtained by means of a trigonometrical network of observation, and with lines connected with them at the points of departure.

“Previously to the operation of obtaining the measurements, the lines of demarcation were examined, those lines having been made by parties having conflicting interests. With this end in view, the agents charged with the operation gave notice in due time to the municipalities and the different proprietors, stating the day appointed for fixing the limits of their lands, and inviting the legal holders to appear personally, or by their representatives, and to furnish the requisite information.

“The position of the trigonometrical points is determined by means of triangulation, taken by starting from bases ascertained by measurement on the land: these triangulations constitute the group of the 1st and 2nd category.

“The group of the 1st category is that which covers, with a continual series of triangles, the entire superficies of a district, and, with the works executed by the topographical staff, is the basis of the maps of each district. It also serves as a double check to the trigonometrical operations made for the continuous districts.

“The groups of the 2nd category are connected with the sides of the triangles of the first group, and determine, by means of small triangles, the number of secondary parts which in each district are required to set out any smaller plots of ground.

“Amongst the trigonometrical points, and in agreement with them, a system of lines is drawn out, which are actually measured, and along these are settled, by means of perpendicular and intersecting lines, all the

angles defining the different posts. These lines, with their references to the trigonometrical points, and with their respective numerical indications, serve for the projection of the original maps, upon which, by means of their co-ordinated lines, the trigonometrical points are previously marked. The land marks being maintained on the land, the lines can always be renewed to ascertain the right position of the places which they had previously served to determine.

“In the event either of numerous accidents to the land, or a too great sub-division of the soil rendering necessary a considerable number of lines, and consequently of numerous land marks, in order to avoid an exclusive complication in the topographical draft, an auxiliary instrument is used, called a circumferentor (*tavoletta pretoriana*), by which, in starting from the trigonometrical points already fixed, a graphical triangulation is obtained, in which are inserted, in an expeditious manner, other landmarks, denominated plain metric points, with which these lines are connected.

“When, in consequence of the steepness of the locality, or difficulty of access, the junction of the plain metric points is not sufficient to give the necessary exactitude to the work, the extreme points of the lines are brought out by means of the circumferentor.

“Finally, in the Alpine regions which are unproductive, or covered with glaciers or perpetual snow, the circumferentor is used for measuring, by the intersection of the peaks of the hills with the lines of the perimeter.”

A special mention is further due to the process adopted for the reduction of the registering maps, and for their reproduction by photography.

The original maps of each commune are usually constructed upon a scale of 1:100,000. These are divided into several sheets, each of which is of the average size of two metres by 1.35 metres, drawn in squares of 1 decimetre.

The first operation made by photography consists in reducing the maps to 1:400,000, that is to say, to one-fourth of their original size. This reduction is obtained with every desirable exactitude by placing the object of the photographic machine at the necessary distance, which is expressed by the following simple formula:

$$S = F \left( 1 + \frac{G}{g} \right)$$

in which  $F$  shows the chief focus of the lens,  $G$  the size of the object to be reduced, and  $g$  the size of the reproduction required.

However exact the reduced map may be with respect to the original, it nevertheless will have certain imperfections, which depend upon

1st. The difficulty of extending in a perfect

manner, the original sheet, on account of its size.

2nd. The curve of the lens, which causes a slight aberration at the extremities of the lines reproduced, an aberration which never exceeds half a millimetre in the perimetral line.

These imperfections are not very serious and do not impair in any appreciable manner the correctness of the reduction, as the relation between the lines of the topographical tracing and those of the decimetral division into squares continues the same.

Obtained in this manner the photographic reduction is produced upon a transparent cloth, marked in squares, upon which the imperfection of the lines arising from aberration is corrected; and by joining together all these various sheets, the map is produced, showing the entire district quite perfect. After this, in order to obtain the number of copies necessary for the reduction to 6,000, photography is again resorted to, but with the interposition of the object glass. It is taken off by exposing to the light the tracing prepared on photogenic paper, which receives and preserves the exact copy of the original tracing.

### 1311.—1147. MOLINARI AND DESCALZI, *Genoa*.

Drawing of an apparatus for building under water.

Three plates, representing the port of Genoa, and three projects for its improvement.

The projects show that their authors have a special knowledge of the wants of a port like Genoa, by keeping in view the number-

less improvements by means of which art has already succeeded in facilitating commercial operations in the ports of other nations, and consequently in augmenting their riches and power. A medal was awarded to the authors of these designs in the Italian Exhibition of 1861.

### 1312. — 1160\* PARADOSSI, OLINTO, *Leghorn*.

Moveable bridge on wheels.  
Albums of drawings.

### 1313.—1059. VALERIO, CESARE, *Turin*.

New system of dry graving dock, for places where there is but little tide. Application of elevating supports for the introduction of the ship into the basin.

This new system has just been applied by the inventor in a place for a merchants' shipping port, which is about to be constituted in the roadstead of Cagliari. The engineer has been entrusted with this work by a company formed by the city of Cagliari and by that of Sassari, and also by several private individuals and banking houses of the island and of the continent.

At the Italian Exhibition of 1861, M. Valerio, the engineer, obtained a medal for this plan; at the present International Exhibition, M. Valerio, as exhibitor, renounced his title to any particular distinction, by consenting to act as juryman for Class X.

## § 2. MATERIALS FOR BUILDING.

The division most fully represented in this sub-class is that of materials for building. Nevertheless, in the present International Exhibition, but a very feeble idea is given of the riches which Italy possesses in this way. Without placing her metals in the list, the chains of the Alps and Apennines furnish stones and marbles of every description, the employment of which only depends upon the facilities of carriage.

Class I., in the general collection of the Museum of Florence (See sect. 5, § 7, 8, 9), and in the special collections (page 63 et seq.) embraces a great number of materials to which the preliminary observations we have made are applicable. There is, moreover, a large quantity of burnt clays; and, as regards cements, there are limestones, sand, pozzolanas, hydraulic cement, plasters, &c., specimens of which, having been displaced by the Jury and placed in Class X., must here be noticed.

### BURNT CLAYS.

The use of bricks is very extensive in Italy wherever clays are met with. They are chiefly made by hand, although in some places machines are used for mixing and grinding the clay, especially in the making of perforated bricks, drain and water pipes of various shapes tiles, bricks, posts, &c. The preference given to manual over mechanical labour, arises obvi-

ously from its lower price; but its present increased dearness has caused the introduction of machinery.

Generally, these products are satisfactory. The most part of the bricks made in Italy resist a pressure of 40 to 50 kilos. without breaking; and there are instances of great works, in which the walls, built exclusively of bricks, resist a permanent pressure of 18 and even of 15 kilos. per square centimetre.

As regards the superior economy of the use of baked earth and cements, lime especially, the decisive question is the cost of the fuel employed, which is generally wood. An experiment upon rather a large scale, and which gave useful results, was instituted in 1846, by the Sub-Alpine government, with English coals, which are used in various parts of Italy. But in several places the more economic use of lignites has been introduced. These are found occasionally in the Apennines; and peat also is used, which abounds in the turbaries at the foot of the Alps.\*

We here give, in alphabetical order, the names of the exhibitors, with a notice of their produce; but what we have said on Class I., Section 5, page 68 et seq., should first be consulted.

**1314.—1140. ALTOVITI**  
D'AVILA, FRANCESCO, *Flo-*  
*rence.*

Cut and coloured tiles, for ornamental pavements, made in the kilns of Lignana (Val d'Arno Superiore).

On account of their compactness, their form, and their varied tints, these products have been honoured with a medal at the Italian Exhibition of 1861.

**1315.—4. ANGHIRELLI, GIUSEPPE,** *Montalcino (Sienna).*  
Floating bricks.

(For other bricks of the same sort, see Class I., Nos. 183, 189).

**1316.—1156.\* ARMAO, GAETANO,**  
*San Stefano di Camastra (Messina).*

Tiles.

**1317.—1165.\* ATENOLFI** (Prince  
of CASTELNUOVA), *Naples.*  
(See Class IX.)

**1318.—1167.\* BACCI, FEDERIGO,**  
*Impruneta Florence.*

(See Class I., No. 158).

**1319.—1142. CARAFA DI NOJA,**  
*Placido, Naples.*

Perforated bricks, with two, four or six holes.

Bricks for monuments.

Do. common.

Tiles of various forms.

Balustres, capitals, and vases in baked clay.

Refractory bricks.

**1320.—1157.\* GAI, FERDINANDO,**  
*Mato (Pistoja).*

Baked earth in slabs for covering roofs, weighing 34 kilos. Price, 13s. the 100.

Baked earth in slabs for pavements, cut by a machine. Price, 3s. 6d. the 100.

**1321.—95. HALL, BROTHERS.**

Refractory bricks of the Tolfa manufactory, for covering the edges of high furnaces.

Refractory bricks for refinery furnaces.

Refractory bricks for boiler furnaces.

Do. do. roasting do.

(See Class I. No. 32.)

**1322.—1158\*. LEE, GIORGIO,** *Sarzana (Genoa)..*

Square slabs, bricks, tiles, and pipes.

\* See what has been said of Lignites and the peat of Italy, page 41 et seq.

**1323.—1159\*. LEONCINI, BROTHERS, Rotta (Pisa).**

Complete collection of brickwork manufactures, consisting of  
 Square polished tiles (Campigiane).  
 Do. average tiles (mezzane), polished.  
 Square average tiles (mezzane), rifled or crossed.  
 Square average plates rolled, large and small.  
 Square average plates, tiles, bricks, bricks for roofs.

**1324.—1149. PETIT BON, GIOVANNI, Parma.**

Hollow tiles, tiles of all sizes, bricks.

**1325.—1151. RONDANI, TOLO-MEO, Parma.**

Tiles made by machinery.  
 Covering for roofs.  
 Bricks.  
 Model of an edifice covered with the above-named tiles, and with the walls built of bricks.

**1326.—1162.\* SAVONA (LOCAL EXHIBITORS' COMMITTEE).**

Collection of refractory bricks.  
 Do. limestones.  
 Do. bricks.

**1327.—1152. SEMMOLA, FRANCESCO, Naples.**

Collection of building materials, from the province of Naples.

**1328.—1153. SPANO, LUIGI, Oristano (Cagliari).**

Unburnt bricks for building.  
 Bricks.

**1329.—1163.\* TAIANI, GIOVANNI, Vietri (Salerno).**

Tiles (*ambrogette*) for pavements, to combine in various designs.  
 Price marked B, £1 1 7 the 100.  
 Do. C, 1 7 3 do.  
 Do. D, 1 7 3 do.  
 Do. E, 1 10 5 do.

The factory employs 40 workmen, with a salary from 10d. to 3s. 4d. per day.

## LIME AND CEMENT.

Limestones and gypsum are very abundant in Italy, and yield excellent results. In the Exhibition there are no pozzolanas, of which, however, we have several important and valuable depôts; they have been the objects of study of many distinguished engineers and chemists, amongst whom we may mention M. Cozzi, of Florence, and Canobbio, of Genoa; and the Commission of Maritime Engineering of that town, which was formerly occupied in examining the pozzolanas of the Maremma and those of Rome. The question of cheapness, like that respecting burnt clays, depends chiefly upon the cost of fuel. Coals have recently been used for burning chalk. At Cagliari lignites have been used with great success in constantly-burning kilns.\*

**1330.—8. BELTRAMI, Count, PIETRO, Cagliari.**

Hydraulic lime from Bannebis do Gonnessa.

**1331.—7. BELTRANI, GIUSEPPE, Trani (Bari).**

Limestone.  
 Tufa.

**1332.—9. BENTIVOGLIO, C., CLAUDIO, Modena.**

Lime obtained by a peculiar process.

**1333.—23.\* COCCHI, BROTHERS, Florence.**

(See the Mortillet collection, No. 1336.)

\* See an important work which the government has entrusted to the engineer, M. Segnorile Joseph, on the chalks of Casale, Turin, Tortona, and Gollisco, of the valley of the Sirlara and Genoa. Turin royal press, 1847.

- Hydraulic limestone from Terra-rossa in the Val di Magra.  
Lime obtained from this stone.  
Plaster stone, white and grey from Sassalbo.  
Plaster obtained from this stone.
- 1334.**—21. CHIAVENNA (SUB-COMMITTEE OF)  
Limestone of Madesimo, near Chiavenna.  
Plaster.
- 1335.**—31. DEL PRINO, MICHELE, *Vesime (Alessandria)*.  
Collection of various sorts of chalks and gypsums of the environs of Aquis.
- 1336.**—32. DE MORTILLET, EUGENIO GABRIELLO, *Milan*.  
Collection of soft lime, in different states.  
Cements.  
Designs and sections.
- 1337.**—127.\* D'ERCHIA ANGELO, *Monopoli (Bari)*.  
(See Class I., No. 170, page 67.)
- 1338.**—1153. SPANO, LUIGI, *Oristano (Cagliari)*.  
Puzzalanos.
- 1339.**—86. PEDEVILLA, FELICE, *Tortona*.  
Limestone and calcareous stone.
- 1340.**—92. QUARTAPELLE RAFFAELLO *Teramo (Abruzzo Citeriore)*.  
Limestone, gypsum, pozzolanos.
- 1341.**—96. ROSSI, FELICE AND NICCOLÒ, *Lucca*.  
Hydraulic lime.  
Price on the spot, 15s. per ton.
- 1342.**—1148. PELAIS, GIULIO, *Poggolino (Pistoja)*.  
Natural cement from Poggolino, Ivrrano, and Ponzano.
- 1343.**—1141. CALZA, ALESSANDRO, *Spezia*.  
Cube of metamorphic manganeseiferous jasper from Beverone, territory of Rochetta, near Spezia, to form an hydraulic cement with hydrate of lime (Vicat's system).  
Hydraulic bitumen, composed of the preceding substance, which has been exposed to the action of the sea.
- GYPSUMS AND PLASTERS,
- 1344.**—1314.\* FORLÌ (SUB-COMMITTEE OF).  
Different plasters.
- 1345.**—134.\* GIUDICE, GASPARE, *Molo, (Girgenti)*.  
Crystallized gypsum in oblique prisms.  
Amorphous gypsum.
- 1346.**—65. MAGRI, DOMENICO, *Bologna*.  
Crystallised gypsum, used for roads.  
Pure gypsum, for stucco objects.  
Plaster of Paris.  
Plaster in powder (*Scagliola*).  
Objects in *Scagliola*.
- 1347.**—69. MASSA, CARLO, *Casale*.  
Gypsum and calcareous stones.
- 1348.**—2085.\* REGGIO (EMILIA), (AGRICULTURAL SOCIETY).  
Plaster stone of Rondinara and of Vezzano.  
Plaster.  
Limestone of Rondinara and Vezzano.  
Lime.
- 1349.**—118. ZICCARDI, NICCOLÒ, *Campobasso*.  
Gypsum, from the quarries of Ripo-somanili, near Campobasso:

## SECTION B.

## SANITARY ARRANGEMENTS IN PUBLIC AND PRIVATE BUILDINGS.

We may observe that as regards this section, Italy is unrepresented in the Great Exhibition. The reason of this is not that this important branch of the art of building has been neglected, or that the study and practical application which such grave subjects demand have not produced any result. To demonstrate the contrary, it is sufficient to recal the ancient and modern aqueducts, the sewage works and drains undertaken in many towns on so grand a scale, and the systems of ventilation and sanitary precautions applied in our public and private establishments.\*

**1350.—1169\* BRUSA, GIOVAN BATTISTA, Milan.**

New calorific system.

**1351.—1143. COLONNESE, FRANCESCO AND GAETANO, Naples.**

Enamelled bricks, of various quantities.

Tubes of various sizes, enamelled inside, for water-closets, drains, &c.

Enamelled tiles of various forms.

**1352.—1161\*. PULITI, CAMMILLO, Florence.**

Gas pipes, doubly enamelled.  
Water pipes.

**1353.—1150. PIANA, GAETANO, Bologna.**

Model of a mode of treating baked earth, covered with enamel and bitumen, to be substituted for the common roofs. They have been used for two years in the house of the exhibitor.

This mode of roofing houses is lighter, more impenetrable to wet, less exposed to fire, and has the advantage of providing the house with a terrace on the roof. (Declarations of the exhibitor).

## SECTION C.

## ARTICLES FOR HOUSE DECORATION.

**1354.—2283.\* CAPRONI, GIOVANNI, Perugia.**

Plan of a square proposed to be opened in the town of Perugia, to be named Place Victor Emmanuel.

**1355.—2284.\* DELLA VALLE, PIETRO, Leghorn.**

Scagliola and other substances in baked earth for pavements.

**1356.—1145. GUALA, GIUSEPPE, Turin.**

Model of the Ionic order of architecture, composed of 24 pieces.

This well-executed model has for its object the instruction of young architects. This idea is suggestive, and should be acted on.

**1357.—2285. GALLIZIOLI, BERNARDO, Brescia.**

Two fresco paintings taken out of a wall, and transferred on cloth.

\* The large and magnificent hospital at Novara deserves a special notice, on account of its recent enlargement, under the direction of the excellent architect-professor Antonelli.

These two paintings, to which it was difficult to assign a place in the classification, have been placed here for want of a better position, and partly in consideration of the difficulty of removal. However it may be, they present a very successful illustration of a difficult and important operation.

**1358.—2287.\* MATTARELLI,**  
GIACOMO, *Lecco, Como.*

Wood model of Milan cathedral,  
on a scale of 1 in 50.

**1359.—2288. PIEGAJA, RAFFA-**  
ELLO, *Lucca.*

Models of capitals, cornices, and  
ornaments in baked earth.

ARTIFICIAL MARBLES.

**1360.—2282.\* CAMPANA, Mar-**  
quis GIOVAN PIETRO, *Naples.*

Antinous, demi-colossal statue,  
Egyptian style, executed after  
the celebrated original in the  
Vatican, imitation of red por-  
phyry, on octagonal pedestal of  
cipollino. Price fixed by the  
exhibitor, £100.

Colossal lion couchant, imitation of  
green porphyry, after the Egypt-  
ian original preserved in the  
Vatican. Price, £80.

Bas-relief, exhibiting the "Last  
Supper," executed with the white  
substance of artificial marble,  
without any pretension to imitate  
Carrara marble, there not being  
time to execute it in imitation of  
*rosso antico*. The cornice is in  
yellow Siennese marble. Price,  
£60.

Large vase of red cipollino, with  
plinth and foot in imitation of  
*verd antique*, in yellow and black  
Portovenere stone. Price, £34.

Colossal vase in Eastern alabaster,  
Bacchic subject, foot and base in  
imitation of granite *rosso antico*.  
Price, £25.

Pair of small columns, imitation of  
red Sicilian jasper. Each of one  
piece. Price, £10.

Three vases, imitation of various  
coloured marbles, with a white  
base. Price, £1 each.

Door-posts, in imitation of green  
marble. Price, £2.

Large round table, diameter 1m.  
80, in one piece, in imitation of  
*verd antique*. Price, £10.

Altar front, imitating yellow mar-  
ble and Sicilian jasper, with  
malachite cross. Price, £9.

Vase with subjects, masquerades,  
the foot in imitation of *rosso an-*  
*tico*. Price, £15.

Round table, imitation marqueterie  
in various colours, with orna-  
ments; in the middle, a painted  
parrot. Price, £10.

This sample is remarkable as offering a  
model of application of painting on artificial  
marbles.

Round table.

Collection of imitations of the finest  
marbles inlaid in a Carrara table;  
price £12.

Same sort, without designs or orna-  
ments; price £7.

Bas-relief. The Virgin and Infant  
Jesus in a small gilt temple, after  
the original of Luca della Robbia,  
existing in the Campana museum;  
price £20.

The Virgin is in imitation *rosso antico*, the  
ground in *verd antique*; the temple is com-  
posed of various marbles.

Two columns in imitation eastern  
red granite, on antique Carrara  
base; price £10.

Verd antique column, on a base of  
white marble; price £12.

Verd antique pilaster, with garlands  
of *giallo antico*; price £10.

Small bas-relief representing the  
Virgin, with incrustations of  
leaves and flowers. The relief  
in imitation of *giallo antico*, the  
ground in *rosso antico*; price £5.

Corner-stone of Spanish brocatello,  
with three incrustations; price £8.

Baluster of ditto. Price £1.

Console table, in imitation of eastern red granite; price £1.

Another, in imitation of persichino; price £3.

Another, in imitation of inlaid marble, in the Byzantine style; price £6.

Round breakfast table, in imitation malachite; price £2.

Do. imitation of Sicilian jasper; price £2.

Do. inlaid; price £2.

Do. smaller; price £6.

The importance and the beauty of the articles exhibited by this industrious and meritorious nobleman, whose products have been already rewarded with a medal at the Italian Exhibition of 1861, compel us to give some details of the manufactures of imitation marbles.

Previous to founding his establishment at Naples, the Marquis Campana had formed one at Rome, in the ancient villa Poniatowski, whence has proceeded various articles exhibited in the halls of the Vatican, and in many of the palaces and churches of the Italian metropolis.

When he determined to quit Rome, the Marquis Campana gave up a part of the property of this establishment to a company (*anonyme*), which has assumed the management of it, the founder still taking a part in it. Upon his arrival at Naples, he undertook the foundation of a new establishment, to which he has devoted all his care and attention. Since its foundation in 1859, the extent to which the new establishment has been carried, and its beautiful productions, will show the importance of the magnificent collection in the above catalogue.

The new establishment is situated in an old monastery. Various machines are used there, such as kilns, lathes, and the tools necessary for sapping, preparing, and grinding the stone, &c. At a short distance from the works (Largo delle Pigne, No. 31 to 34), are spacious rooms for the exhibition of the articles made, as well as large warehouses.

The necessary power for the various works is obtained by animals, but it is now under

consideration whether a steam engine should be employed.

The present number of workmen employed is about forty. Many of the artists, to which the Marquis Campana had given their practical education in Rome, are now employed in the new Neapolitan establishment.

From information furnished by the Exhibitor, it appears that since its recent foundation this magnificent establishment has used up not less than eighty-nine tons yearly of calcareous rock, which, constituting the chief material of manufacture, produces three hundred square metres of marble slabs for walls, tables, furniture, and various other architectural decorations.

Considering the date of the foundation of the model establishment at Rome, seven years previously, and the state of the articles produced up to that time, we have a sufficient proof of their durability and their solidity, as the columns, slabs, door-jambs, altars, pavements, and works of art, not only have not sustained any appreciable alteration, but still preserve their primitive marble freshness.

We are now informed that the establishment has just brought a work of art to a successful result,—we mean the reproduction of one of the two bas-reliefs of the triumphal arch of Alphonso of Arragona, at Castel Nuovo, at Naples. This bas-relief, from a pure design and of fine execution, has been reproduced in two of the most beautiful and harmonious marbles in existence, the *giallo* and *rosso antico*.

This fine work has been executed for his Majesty the Emperor Napoleon III.

**1361.**—2862.\* **LEG A, MICHELE,**  
*Forlì.*

Artificial marbles.

**1362.**—1154. **TREVES, M.,**  
*Florence.*

Artificial marbles.

**1363.**—1155. **ZECCHINI, G.,**  
*Messina.*

Artificial marbles.

## CLASS XI.

### MILITARY ENGINEERING, ARMOUR AND ACCOUTREMENTS, ORDNANCE AND SMALL ARMS.

The manufacture of firearms, formerly so flourishing in the free and independent Italian states, necessarily became extinct where the conditions essential to national existence were lost; for example, in Lombardy, where the manufacture of arms was formerly so considerable, it dwindled to nothing under the dominion of Austria.

The royal manufacturers of arms, and the arsenals of the kingdoms of Naples and Sardinia, usually kept their works in a sufficiently effective state to meet the wants of their respective governments; but whilst Austrian influence predominated it was impossible for them to make progress in the art, and still less to increase their establishments.

At the present time it is incumbent upon the new kingdom of Italy to make the sacrifices necessary to her consolidation, and above all to increase her military power, not only by augmenting the number of her soldiers, but by acquiring the possession of those new and powerful engines of war which are indispensable at the present time.

The government of Italy is therefore bound to bestow great attention upon her arsenals and workshops; and it is her duty to encourage the establishment of large private factories, like those which the administration of the army and navy seem desirous of forming. In order to make rapid and certain progress it will be necessary to act upon the information which public discussion and the opinion of practical men cannot fail to elicit; in England much that is valuable has been secured by the Institution of Civil Engineers, which reckons among its members numerous influential individuals belonging to the military profession, and others engaged in the manufacture of implements of warfare. France already possesses a similar institution.

In many towns and villages, manufactories of arms are being established; and the vast private establishments of Gardone, in the province of Brescia, which for many centuries were celebrated for the perfection of their work, are now endeavouring, after a long period of compulsory inaction, to resume their ancient importance.

In the territory of Lecco another factory, recently built, is making efforts to compete with foreign houses. In Milan there are 20 manufactories of the more costly descriptions of arms, where guns, pistols, sabres, and swords are well made, according to the usual forms, together with richly ornamented arms of every description, and where barrels and blades, made in the country, are united with native or English cut steel, in a highly artistic manner. Naples furnishes some splendid specimens of this kind, and the same may be said of other factories, which are starting and increasing in different provinces.

The manufacturers of arms at Turin, Bergamo, Brescia, Milan, Florence, and Naples have severally some special manufacture in which they are exclusively employed, especially in gunlocks; and arms of this description have been selected by the Italians for sending to the great International Exhibition.

Military clothing, tents, and camp equipage are represented by a small number of specimens, although the articles of this kind manufactured are very numerous.

Amongst the military weapons there are none very remarkable for special invention or for any new improvement; this may easily be accounted for by the fact that the existing manufactories, having been suddenly called into greater activity, have not had sufficient time to devote attention to the making of improvements. The great superiority of rifled barrels in projecting conical bullets has only been recognized at a time when political disturbances have compelled the adoption of the quickest and most economical method; and we have been under the necessity of deferring to a future time the diminution of the bores, which in turn would allow a reduction in the weight of the cartridges.

To this important question of the diminution of the bore must be added that of loading, whether at the breech or the muzzle. Prussia has already supplied her army with muskets

of the first description. Several other states have adopted it for particular arms. In short, general opinion, both for muskets and for pieces of artillery, is in favour of it.

In the report of the Juries of the Exhibition of 1851, the use of Cavalli's breech-loading cannon was formally rejected; but since that time this method has been generally approved, owing to the improvement made in the material, and the changes which, after further consideration, have taken place in the opinions of practical men. The improvements required in the working of Cavalli's breech-loading gun have since been worked out, still preserving his plan intact, which is exceedingly simple.

The summary condemnation of Cavalli's gun, at the period of its introduction, was only that opposition which new plans too frequently encounter. This was the more striking as in this invention there were two innovations, equally important—the rifling and loading at the breech, with the option of being able to load it also at the muzzle.

This condemnation has been reversed, in consequence of experiments made in the field (see Report upon Rifled Cannon in 1862); and the use of rifled cannon has been generally adopted, with various modifications, many of which are entirely unconnected with each other, but which tend to prove that, until the present day, none of the plans in use had attained perfection.

The varieties and differences in the models of rifled guns are still greater than those of cannon, although the former were first invented. The use of a conical bullet, which prevails generally at the present day, impairs the correctness of the aim as soon as certain limits are exceeded. The conical bullet does not permit a great reduction in the size of the bore, which would be necessary to lighten as much as possible the weight of the cartridges, as the windage of the projectile cannot be diminished in the barrel without making the loading through the muzzle more difficult. Again, the weight of the cartridge could not be much reduced without diminishing the expansion, or propelling power, keeping in view the necessity of making the ball pass through the centre of the barrel. Hence, recourse has been had to the system of breech-loading, which secures that advantage as well as many others. It is only by diminishing the weight of the cartridge that we can produce a musket both simple and effective, with a cartridge equally simple and effective, so as to enable the soldier to load rapidly, with the bayonet fixed, whether lying down, or in the dark, or during bad weather. This model gun is an object much desired everywhere.

Several states have adopted fire-arms which do not satisfy all the conditions above indicated. Italy is interested, more than any other nation, in this question, since she is compelled at present to supply herself with large quantities of arms upon the old plan, well knowing that sooner or later she will be compelled, at a vast expense, to provide her army with a new and improved arm.

These considerations, perfectly correct as regards guns, are equally applicable to artillery. The pieces exhibited in the Italian department are:—

1st. A mountain cannon.

2nd. A mountain cannon of large calibre. 121 mm.

Both are brass pieces, rifled according to the method of the able French Colonel Treuil de Beaulieu. The second is exhibited upon a Cavalli carriage, a model of 1844. This carriage weighs 500 kilos, and the piece 750 kilos. In the last campaign, the frequency of the discharges caused the guns to burst, but none of the carriages were injured.

3rd. A cannon of large calibre, one of twenty-two cast towards the end of 1846.

Twenty were of 165 mm.-bore, and two of 208 mm.; the weight of their respective balls was 7½ lbs. to 15½ lbs. They were projected by a charge of powder of one-third or one-quarter of the weight. When rifled, these cannon have discharged hollow projectiles made at one casting, of a cylindric-ogival form, of double the weight of the balls. By this plan it was hoped to combine the projectile force of solid balls with that of Paixhan shells, but in a much higher degree than the latter, and with a range five times as great, and an accuracy of fire which at great distances was altogether unequalled. These results demonstrate the complete success of the rifled guns, which Cavalli was the first to achieve, by the testimony of Paixhan himself. (See "Military Institutes of France," 1849, p. 225; and note 3, page 6, of the "Aperçu sur les Canons rayés de Cavalli," 1862.)

A model of an iron-plated battery, with the above gun of Cavalli, has been also exhibited as it was constructed before Gaeta. The very simple arrangement, by which the recoil is prevented, so that a single gunner is enabled to load, point, and discharge it, deserves attention. In this battery may be seen the model of a gun with the improvements made by Cavalli, who has done away with the trunnions, and substituted a method for them similar to that used for carronades, in order to make the embrasures of the plated wall as small as possible. In fact, by his plan of breech-loading, the inventor had in view the getting rid of the recoil, so that the gun should be constantly kept in its place in the battery, and thereby close completely the embrasure, which should be sloped as much as possible, since such an arrangement alone secures invulnerability, whether by sea or land.

## SECTION A-B.

## CLOTHING AND MILITARY EQUIPMENTS.

- 1364.**—1641. BELTRAMI, PIETRO, *Milan.*  
 Hat of an Italian general.  
 Do. English admiral.  
 Do. French general.  
 Do. Austrian officer.  
 Do. do. without ornaments.  
 Do. do. to fold up.
- 1365.**—1170. BINDA, AMBROGIO, *Milan.*  
 Silk and woollen cravats.  
 Officers' scarves in silk and wool.  
 Scarves in silk and wool mixed.  
 Bone buttons.  
 Mother-of-pearl buttons.  
 Horn buttons.  
 Wood buttons.  
 Cloth buttons.
- 1366.**—1180. EXCOFFIER, GIUSEPPE, *Asti (Alessandria).*  
 Military observatory, to be placed at any height.
- 1367.**—1171. FAMOLI, GIACOMO, *Turin.*  
 Rifleman's plume.  
 Officer of marine infantry's plume.
- 1368.**—1181. GALLI, G. F., *Milan.*  
 Waxed cloth.
- 1369.**—1183.\* HENKEL, LUIGI, *Florence.*  
 Impermeable military tent.
- 1370.**—1182. SIPRIOT, CASIMIO, *Milan.*  
 Two waxed cloths for artillery.  
 Do. railway waggons.  
 Raw waxed cloth.

## SECTION C.

## WEAPONS.

- 1371.**—3. ALDISIO, GIOVANNI AND Co., *Turin.*  
 Gun-barrel in rough iron, cold-hammered. (See Class I., No. 25.)
- 1372.**—1190. BERNARDI, PIETRO, *Rimini.*  
 Soldier's musket.
- 1373.**—1213\*. BEVILACQUA, PASQUALE, *Campobasso, Molise.*  
 Gun-barrel.
- 1374.**—2009\*. BORANI, CARLO, *Turin.*  
 Sword of honour presented to General Della Marmora, by the Tuscans.  
 Sword of honour presented to General Della Marmora, by the Legations and the Marches.  
 Sword of honour presented to General Della Marmora, by the Committee for presenting a testimonial to the Sardinian army of the Crimea.

**1375.—1215\*. BRESCIA (SOCIAL MANUFACTURE).**

Rifles.

The Social Manufacture can send out every month—army muskets, 2000; fowling pieces, 400; pistols, &c., 400. 500 workmen are employed by it, and it has in circulation £4,000 monthly.

**1376.—1191. COLOMBO, CARLO MARIA, Milan.**

Fowling pieces.

Side arms.

Revolvers.

**1377.—1192. COMINAZZI, M., Gardone (Brescia).**

Pistols.

**1378.—2364. ROYAL ITALIAN COMMISSION, in the name of His Majesty the King of Italy.**

Sword presented in 1859, to King Victor Emmanuel II., by the Romans, made by M. Castellain, goldsmith, Rome.

Sabre presented in 1859, by the inhabitants of Modena, Guastalla, Massa, Castelnovo, and Fivizzano, to H.M. the King Victor Emmanuel II., made by M. Rinzi, Milan.

Sword belonging to the King of Italy.

Sabre belonging to the King of Italy, with the inscription: "All' Industria Italiana."

Sabre presented by the artist Mongianais to H.M. Victor Emmanuel II., King of Italy.

**1379.—1193. DE STEFANO, BROTHERS, Campobasso.**

Foil.

Sword.

Cutlass.

**1380.—1214\*. DI TORO, COSIMO, Campobasso.**

Three armed sticks, of different form and size.

**1381.—1194. FUSCO, FRANCESCO, Benevento.**

Double barrelled pistol in one piece.  
Gun barrel of new construction.

**1382.—1196. IZZO, ALFONSO, Naples.**

Double-barrelled fowling-piece.  
Fowling-piece with barrels, made on a new plan.  
Revolving carbine, made on a new plan.

**1383.—1198. LABRUNA, GIUSEPPE, Naples.**

Sabre complete.

**1384.—1197. LANCIA, GIUSEPPE, Turin.**

Breech-loading cannon.  
Musket.

**1385.—1216.\* LANDI, GIOVANNI, Salerno.**

Model in wood of a revolving barrel.

**1386.—1199. MARELLI, AGOSTINO, Milan.**

Fowling-piece.  
Blunderbuss for sportsmen.  
Rifleman's pistols.

**1387.—1200. MAZZA, SALVATORE, Naples.**

Two-shot ornamented fowling-pieces.  
Five-shot revolving carbine.  
Double barrelled safety fowling-piece.  
Double barrelled fowling-pieces.  
Small rifled carbine.  
Small guns, called *Schizzetti*.

**1388.**—1201.—MEROLLA, SALVATORE, *Naples*.

Double-barrelled gun.

**1389.**—1202. MINOTTINI, G., & LANCETTI, F., *Perugia*.

Inlaid box, containing the engraved sword presented to H.R.H. the Prince Umberto by the ladies of Umbria. The case made by M. Lancetti, the engraving by M. Minottini.

**1390.**—1217. MONGIANA (ROYAL METALLURGICAL ESTABLISHMENT OF), *Calabria*.

Rifled gun for infantry.  
Percussion lock for the same.  
Carbine and sabre for riflemen.  
Lock for the same.  
Damascened sword blade.

Excepting the last article, the raw materials for the above (iron and steel) were derived from the above establishment.

**1391.**—1203. MURATTI, ANIBALE, *Naples*.

Mechanism for pressing fulminating powder into percussion caps.  
Model of a mortar-bed for a mortar of 22 centimetres.

**1392.**—1210. TORRE ANNUNZIATA ROYAL MANUFACTURE OF ARMS.

Lock for fowling piece.  
Lock for double-barrelled fowling piece.  
Damascened barrel for fowling piece.  
Damascened sword blade.

**1393.**—1195. NESTI, F., *Florence*.

Helmet, made of a single piece of iron.

**1394.**—1204. PARIS AND MICHELONI, *Brescia*.

Gun of French pattern, in separate pieces.  
Fowling piece, in separate pieces.

**1395.**—1204 *bis*. PARMA, ROYAL FOUNDRY.

Machine for rifling barrels.

**1396.**—PILLA, GIOVANNI, *Benevento*.

Six-barrel pistol, of which each barrel explodes separately by once pulling the trigger.

The barrels are in damascened iron wire.

**1397.**—1207. PRIORA, GIUSEPPE AND Co., *Milan*.

Revolving pistol.  
Revolving carbine.

**1398.**—1207. RISSONE, LUIGI, *Parma*.

Lead musket bullets of various forms.

**1399.**—1208. SICHLING, ANTONIO, *Turin*.

Collection of sabres and swords, hunting knives, and pieces of steel for damascened blades.

**1400.**—1972. SPETRINI, LUIGI, *Campobasso*.

Engraved dagger.

**1401.**—1209. SQUINZO, LUIGI, *Cagliari*.

Seven barrel revolver.  
Revolving carbine, with eight shots and bayonet.  
Model of the revolver and carbine.

**1402.--1211. TOSCHI, ALESSANDRO,**  
*Lugo (Ravenna).*

Two six-shot revolving firearms.

**1403.—1212. TRAVAGLINO,**  
*CARLO, Pisa.*

Model of naval battery, composed of eight pieces, to be served by six men.

**1404.—1218.\* TURIN (ROYAL ARSENAL).**

Seventeen centimetre howitzer, rifled in two grooves, and breech-loading (Cavalli's system).

Ammunition box for the same.

Rifled service gun, 16 B.

Rifled mountain gun 5½ B.

Cylindro-ogival grenades of 17 centimetres.

Grenades of 12 centimetres.

Grenades of 8 centimetres.

Bronze medal representing His Majesty Victor Emmanuel.

Statue of Balilla (by M. Giani).

Plated mantelet (Cavalli's system) for a 17 centimetre shell.

Wood model of a 17 centimetre shell, in proportion of one-fifth.

Model of Cavalli's plated battery, used in the siege of Gaeta.

Field battery, pattern 1844.

Mountain carriage, pattern 1844.

Rammer and sponge of cannon 8, rifled pattern 1844.

Rammer and sponge of mountain gun, pattern 1844, of 5½.

Worm and sponge of cannon of 8 B. rifled.

Field quoins.

Field carriage wheels, pattern 1844.

Field carriage wheels, pattern 1844.

Field carriage bucket, pattern 1844.

Lever for the transport of mountain artillery,

Carriage shafts for mountain gun, pattern 1844.

Drag of carriage for field gun, pattern 1844.

Moveable bottom of carriage for field gun, pattern, 1844.

Pointing screws of field carriage, pattern 1844.

Pointing screws of mountain carriage, pattern, 1844.

Axe.

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## CLASS XII.

### NAVAL ARCHITECTURE.—SHIPS' TACKLE.

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**1405. — 1225. TAGLIAGOZZO,**  
*PACIFICO, Rome. (Harleyford Terrace, London).*

Combination of river barges, capable of being put together, so as to form a seagoing seaboard.

## CLASS XIII.

### PHILOSOPHICAL INSTRUMENTS.

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The manufacture of philosophical instruments would be in Italy what it is in other countries, if her resources were more fully developed. As, however, this is not the case, it follows that this branch of manufacturing industry is not in a flourishing condition. That which has been accomplished with us is the result of the isolated efforts of individuals; the merit consists in the idea and invention, for it is not the offspring of that active industry which alone can command perfection in work and that cheapness from which arises its general diffusion for common purposes.

We, however, must here award a special mention to Professor Giovanni Battista Amici, as an inventor and manufacturer. To him are due almost all the improvements effected during nearly half a century in the microscope. M. Amici was one of the first who obtained achromatic object-glasses, made the catadioptric microscope with ellipsoidal mirror, and afterwards the horizontal and inclined microscope, in use during a period of many years. He combined object lenses with different glasses, and in this way was able to obtain almost achromatic images. He devoted great attention to the aperture, or to the angle of aperture of the glass interposed between the object and the lens is changed, he conceived the happy thought of getting rid of the necessity of all correction, by interposing between the first lens and the glass which covers the object, a liquid whose index of refraction is equal to that of the glass, and the dispersion of which would facilitate the correction of this last aberration, which had been previously unaccomplished with the best achromatic glasses.

From the introduction of a liquid between the lens and the glass above, there resulted further an enlargement of the luminous cone embraced by the instrument, and cutting a large aperture which reaches above  $160^\circ$ , and a neutralising power above any which had been previously obtained. The instruments constructed in the workshop of M. Amici, and scrupulously verified by himself, are in the hands of naturalists in all parts of the world, who apply to him when other very skilful opticians fail of success.

M. Amici not only laboured to make microscopes more perfect, but he knew, moreover, how to derive admirable results, by his studies on the circulation of the sap in plants, on the form of the *stomata*, upon the nature of several cryptogamous plants, upon muscular fibre, and, above all, upon the fecundation of vegetables. The camera lucida, foreseen by Cooke, and invented by Woollaston, received from M. Amici a great many modifications which rendered it either more convenient to receive the image of the scene, or better fitted to be used for microscopical drawing.

Whilst he was applying himself with so much success to the improvement of the means of investigating the nature of diminutive objects in our immediate proximity, his genius and his hands were also directed to the improvement of telescopes for astronomical purposes. Whilst still young, he conceived the idea of a telescope with a vertical and immovable tube, which, if it had not been for the fall of the Italian kingdom, would have perhaps rivalled those of Herschel and Rosse. He moreover cast mirrors of a considerable size, and gave them, with exquisite art, a parabolic curve; he improved the ocular micrometer, with double image, of Bouguer and Ramsden; he polished the most perfect achromatic object glasses, and of an unusual size; and, basing his labours upon certain calculations conceived by Professor Mosotti, he constructed object glasses with a very short focus, and almost without any aberration. Sextants and other reflecting instruments received from M. Amici a remarkable improvement. Even the humble surveying rule and the level found in his hands new forms and an exquisite delicacy. After the discovery of the polarization of light, made by Malus, and studied by so many geometers and learned natural philosophers, M. Amici directed his atten-

tion to it, and invented the instrument commonly known as the "polarizing microscope," although it is not used always as a microscope, but often as an opera glass or a telescope.

The study of the crystalline forms of bodies, and the position of the different axes of optical elasticity in the interior of bodies, found a powerful aid in this instrument.

We will not refer here to the prism, nor to a thousand expedients by means of which this illustrious optician succeeded in conquering difficulties which, up to that time, had been insurmountable. An examination of different instruments exhibited by him would give a better idea than anything we can say of the talents which conceived and perfected them; unfortunately they have not been sent to London.

In the history of the physical sciences the name of the most illustrious of modern philosophers, that of Alexander Volta, occurs, to whom we are indebted for the discovery of electricity by chemical affinity; and the University of Pavia, proud of having possessed this eminent man, has sent to the Exhibition some instruments constructed and used by him.

Nobili, who improved the galvanometer, and invented metalochromy—Melloni, who has done so much for the study of caloric—and other living philosophers, are sufficient to show, by the apparatus and experiments which they have invented and executed, how Italy might easily, with liberty and peace, resume her place among those nations of the world which are most distinguished for scientific experiments.

M. Professor Gonella made, for the purpose of facilitating calculation, certain machines, which very well answer their object. He constructed a *planimeter*, which measures with certainty any area, however irregular its form may be.

The electric telegraph tested the talents of many *savans*, and the present Exhibition, by making known the various telegraphic systems, and some modifications of the electro-motors, or the machines which receive the impulse from them, will testify to the value of these experiments. (See Class VII.)

Although it is not in the Exhibition, we must mention the *pantograph* of M. Caselli, which, on many grounds, has recently attracted general attention.

#### WEIGHTS AND MEASURES.

##### 1408.—1243\*. MURE, BROTHERS, *Turin.*

Steel meter, divided into millimetres.

*Toise.* Military measure, new pattern.

#### CALCULATING MACHINES.

##### 1407.—1231\*. GONNELLA, PROF. TITO, *Florence.*

Machine to make the addition of whole numbers and decimal fractions, composed chiefly of six numbered moveable wheels, contained in a mahogany box. Price, £6 15s.

Ditto, with nine stops.

For thoroughly comprehending the action of these mechanisms see the description of two arithmetical machines at Florence, 1859.

#### OPTICAL INSTRUMENTS.

##### 1408.—1235. AMICI, GIOVANNI BATTISTA, *Florence.*

(See preceding page.)

##### 1409.—1228\*. CASSANI, EMILIO, *Milan.*

Opera glasses, mounted in steel and in packfong.

#### LAND-SURVEYING APPARATUS.

##### 1410.—1226\*. BIFEZZI, GIUSEPPE *Naples.*

Telegrometer — Instrument intended to level distances rapidly.

##### 1411.—1229\*. CASUCCINI, PIETRO, *Sienna.*

Water level, capable of acting as an eclimeter.

##### 1412.—1230\*. FAADI BRUNO, ALESSANDRO, *Alessandria.*

Ellipsograph.

##### 1413.—1239. ROBERTO, PAOLO, *Naples.*

Genometer.

Graphic method for rapidly forming metrical scales in all proportions, using linear design.

## MISCELLANEOUS INSTRUMENTS.

**1414.**—1236. BANDIERI, GIOVANNI, *Naples*.

Hydrostatic balance of various heights.

Cordometer with many cords and stops.

Electrodynamic apparatus.

Apparatus for the parabolic curves of solids.

**1415.**—1229 *bis*. CHAPUSOT, *Turin*.

Model of an eccentric, applicable to pumps.

**1416.**—1234.\* MARCHI, ULISSE, *Florence*.

Thermometrograph of a new shape, to measure the maximum and minimum temperatures in the absence of the observers.

**1417.**—1238. PAVIA (PHYSICAL MUSEUM OF THE UNIVERSITY OF)

(See Class XXIX.)

Instruments invented and constructed by Volta.

Condensator.

Condensing electrometer.

Electroscope for the study of atmospheric electricity.

Lane's electrometer.

Belli's hygrometer.

Bellows pycnometer, by Belli.

Cartoni's thermometrographs.

## ELECTRIC TELEGRAPH AND ELECTROMOTOR APPARATUS.

**1418.**—1227.\* BONELLI, GAETANO, *Turin*.

Typo-electro-chemic telegraph, capable of sending 500 despatches per hour.

**1419.**—1233.\* LUCIFERO, TOMMASO, *Messina*.

Constant chloride of sodium pile.

Its durability may be about a twelvemonth. The product of carbonate of zinc may defray completely the cost of keeping it at work.

Electro-chemical telegraph, with improved bath and newly-invented manipulator.

The first is founded upon the deviation of the needle on account of currents. The second gives a letter at each motion. The system has no electro-magnets, and works with rapidity and economy.

**1420.**—1237. MANUELLI, GIACOMO, *Reggio*.

Constant pile with coal diaphragm.

**1421.**—1240.\* MARONI, MARCO, *Milan*.

Modification of Morse's telegraphic system, the object being to increase the sensibility.

The modification consists in the substitution of an electro-magnet penetrated by the current of the line, and arranged in such a way that the poles are made to be opposite the contrary poles of the chief electro-magnet.

**1422.**—1241. MILESI, ANGELO, *Bergamo*.

Electro apparatus for taking votes in great assemblies.

**1423.**—1242.—MINOTTO, GIOVANNI, *Turin*.

Electrometer with constant force.

**1424.**—1151. RONDAMI, TOLOMEO, *Parma*.

Baked earth diaphragms for voltaic piles.

(See, for the Electric Communicators of M. Vincenzi, the Electric Looms of M. Bonelli, Class V. and VIII., and the electric sorter of M. Sella, Class I.)

## CLASS XIV.

## PHOTOGRAPHY AND PHOTOGRAPHIC APPARATUS.

Leonardo de Vinci, towards the end of the fifteenth century, having discovered the camera obscura, afterwards improved and popularised by G. B. Porter, many persons soon attempted to fix the images which became impressed, by the lenses, upon the walls of their room, but all those efforts were unavailing until the time of Wedgwood, Davy, Niepce, Talbo, and Daugerre. At length, about the year 1838, photography was invented, and since that time improvements have been continually made in the art. Having been first brought into use in other countries, and requiring chemical substances and apparatus not made in Italy, its process was introduced amongst us as a foreign art; and, with some rare exceptions, our photographers draw from abroad all their materials, even to their photogenic preparations. In this cradle of the arts, nevertheless, artists are not wanting; and their photographic reproductions, obtained in spite of many difficulties, are often distinguished from analogous productions of other countries by their really artistic merit. Applied to the reproduction of the images of great monuments and works of fine arts, photography produces in Italy, more than elsewhere, inimitable originals; and it commands for these experiments something higher than a mere industrial merit.

Amongst all the other specimens we must notice the photographic reproduction of the frescoes of the Campo Santo of Pisa, exhibited by M. Van Lint, which may henceforth possess the unfortunate but still priceless merit of giving us an historical insight into those marvellous works of art so seriously damaged by time during ages which have passed away.

A noble sentiment has inspired M. Van Lint, as, in addition to the deplorable state of these celebrated paintings, he had to conduct his experiments whilst surrounded with local difficulties; and the album of Campo Santo of Pisa will be in itself a lasting monument, as well from the objects it seeks to perpetuate as from the beauty of the proofs simply as specimens of photography.

It is proper to add that the care bestowed upon the preservation of what remains of these paintings of the Campo Santo have received additional attention in our days, and by ingenious contrivances, executed by skilful and devoted hands, they have succeeded in securing on to walls the parts which are ready to fall—without in the smallest degree touching the painting.

Other artists, not less to be commended for their intelligent devotion, avail themselves of the photographs of M. Van Lint, taken with a weak impression; they afterwards put in the colours, and endeavour, as much as possible, to reproduce by the colouring those precious pictures.

Very few artists have otherwise sent proofs to the Exhibition, and we here give the names of those who are entitled to be mentioned:—

**1425.—1251.\* ALINARI, BROTHERS, Florence.**

Panorama of Florence.  
Place della Signoria, Florence.  
Belfry of the dome of Florence, of Giotto.  
The Last Supper of Raphael.

Camposanto of Pisa.  
Views of the interior.  
*Carte* portraits.  
Various portraits.  
Photograph reproduction of the designs of Raphael, from the galleries of Florence, Venice, and Vienna.

**1426.—1452.\* CHIAPELLA, FRANCESCO MARIA, Turin.**

Various photographs on paper and on silk.

**1427.—1245.\* DURONI, ALESSANDRO, Milan.**

Photographs.

**1428.—1253. FRATACCI, C., Naples.**

Photographs.

**1429.—1246. MAZZA, EMILIO, Milan.**

Photographs.

**1430.—1247. MODENA (SUB-COMMITTEE OF).**

Application of photography to oil-painting.

**1431.—1248. RANCINI, CARLO, Pisa.**

Miniature in photography of a fresco of Benozzo Gazzoli, of the Camposanto of Pisa. Price £40.

**1432.—1249.\* RONCALLI, ANTONIO, Bergamo.**

Photographs of microscopic objects, reproduced after nature.

**1433.—1250.\* VAN LINT, ENRICO, Pisa.**

Photographic reproductions of the Frescoes of the Campo Santo at Pisa.

## CLASS XV.

### HOROLOGICAL INSTRUMENTS.

Although it appears, from several documents, that modern horology originated at Arcetri, a charming locality in the hills of Florence, from the prodigious genius of Galileo, this art was transferred at an early period to Holland, where Christian Huyghens applied the pendulum to the old clocks, which were regulated before that time by a balance-wheel, which acted as a regulator, without however making the oscillation isochronous. The Dutch were soon excelled by the English, who have at present maintained their superiority over every other nation in fine clock-work. France rivalled and still rivals England; and Switzerland stands before any other country in the quantity of chronometrical watches which her manufacturers bring into the market.

Italy only holds a humble place in this branch of industry. In several towns there have been very skilful clockmakers who have endeavoured with varying fortune to make new watchworks, but manufactories of watches have never existed, unless the schools of Cluses, of Sallanches, and Bonneville, opened in Savoy by the Piedmontese government before the cession of those provinces to France, deserves that name. In 1853 the school of Cluses gave an annual product of £20,000.

**1434.—1255. BERNARD, AUGUSTO, Naples.**

Public clock.

Mechanical apparatus for dioptric lighthouses.

**1435.—1256. DECANINI, COSTANTE, Florence.**

New mechanism for clocks.

**1436.—1257. MANUELLI, GIACOMO, Reggio (Emilia).**

Escapement.

**1437.—1258. OLETTI, PIETRO, Turin.**

Astronomical clock.

## CLASS XVI.

### MUSICAL INSTRUMENTS.

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Italy has been for a long time celebrated for certain musical instruments, and particularly for stringed instruments, which were carried to such a high degree of perfection by the Stradivari, the Guarneri, and the Amati. She has also possessed very skillful organ builders; and, in the present day the factory of Serassi, of Bergamo, enjoys a great reputation, even amongst those nations which have made the greatest progress in the art of organ building.

There are three factories at Pavia, which turn out twenty complete instruments yearly; and with those existing at Bergamo, Lombardy may be said to have 13 manufactories.

Wind instruments are made in many Italian towns, and the clarionets made at Milan are remarkable for the superiority of their tone. Pelitti has a real industrial establishment, but his business is confined exclusively to the manufacture of brass instruments. His counter-bass in B flat, and other musical instruments, have been adopted by military bands. Besides M. Pelitti's manufactory there are three manufactories of metallic wind instruments at Milan and one at Brescia.

M. Vinatieri, of Turin, and other artists make excellent wood instruments, which are appreciated even out of Italy. There are also in the country manufactories of Barbary organs, of which several are very famous.

We have also manufactories of drums, big drums, cymbals, &c., but our manufactures of pianos rank highest in importance. The southern provinces, the ancient duchies, Lombardy, Venice, and Piedmont, have a great number, several of which supply excellent articles.

Nevertheless, except catgut, which is manufactured at Naples in a high degree of perfection, all the remaining parts requisite for making instruments come from abroad, and the Italian manufacturers are compelled to confine their business to the combination, in the best possible manner, of all the various articles, which they aim at improving, so as to produce the best effect in regard to tone, softness, and durability.

Harmoniums, organs without pipes, and with open or folding reeds, are also made in Italy, but in less number than pianos, notwithstanding the almost identical nature of the manufacture, and that in both cases the chief parts are brought from abroad.

We must finally say of the organ, and register and repetition piano of M. Marzolo, which astonishes even the boldest investigators of marvels by the elegance and precision with which they have resolved a problem which, before his time, had been deemed impracticable; and we may add one word upon the melodium piano of M. Fummo, who has combined the action of the piano and the harmonium with separate keys, but which, like many others, although marked in the English Official Catalogue, does not appear in the Exhibition.

#### STRINGED INSTRUMENTS.

**1438.**—1267. DE MEGLIO, LEOPOLDO, *Naples*.

Grand pianoforte.

**1439.**—1270. MARZOLO, GIUSEPPE, *Padua*.

Organ, which prints and repeats the music played above. The same

system of rotation and repetition movement is applicable to the piano.

#### BRASS WIND INSTRUMENTS.

**1440.**—1268. FORNI, G., *Milan*.

Clarionets.  
Flutes.

**1441.—1276.\* PELITTI AND SON,**  
*Milan.*

Barytones in *do* and in *si* flat.  
 Bombardines.  
 Bombardons in *fa* and *mi* flat.  
 Bombardon, with belt.  
   Do. straight.  
 Bombardine in *si* flat.  
   Do. with four pistons.  
   Do. with three pistons.  
 Clavicorne in *si* flat.  
   Do. *mi* flat.  
 Cornet in *si* flat.  
 Contraltos.  
 Counter-serpent.  
 Cornet-a-pistons.  
 Duplons in various tones.  
 Flicornes, with three pistons.  
 Pelliton in *si* bass.  
 Pelliton with pistons.  
 Pellitons in *mi* and *si* flat.  
 Soprano in *mi* flat.  
 Trombones with 3 pistons, in *si* flat.  
 Trumpets in *sol*.  
 Trombonnes.

Piston trumpets.  
 Round trumpets.

## PERCUSSION INSTRUMENTS.

**1442.—1265. AJELLO, SALVATORE,**  
*Naples.*

Rows of musical strings, in bundles  
 of different sizes.

**1443.—1266. BOCCACCINI, AN-**  
*GELO, Pistoja.*

Great drum, with internal me-  
 chanism.  
 Drum with internal mechanism.  
 Drum with external mechanism.  
 Common drum.

**1444.—1266 bis. BOLGE, TERESA,**  
*Brescia.*

Brass drum and case.  
 Drumsticks in common wood.  
 Drumsticks in ebony.

## CLASS XVII.

## SURGICAL INSTRUMENTS AND APPLIANCES.

In no part of Italy are there establishments for the manufacture of surgical instruments to be placed in comparison with those of England, France, and Germany, or which could compete with them in the general markets of the world. Nevertheless, as surgery has at all times been practised with success in Italy, the making of surgical instruments has always been equal to her wants.

Italian manufacturers have produced instruments of much excellence in every respect; and several of them have carried off the prize at the great Exhibitions of Paris and London.

There are extensive establishments for the manufacture of surgical instruments at Bologna, Parma, Milan, Brescia, Turin, Treviso, and Naples, without mentioning other less important but respectable workshops, situated at Florence and elsewhere, and often in localities far from the great centres of population.

The same may be said with regard to implements and apparatus for orthopædy, which are manufactured of excellent quality at Milan, Turin, and Florence; there are also, especially at Florence, intelligent artists to whom we are indebted for remarkable constructions adapted to the treatment of diseases or deformities; but generally these factories are under the necessity of obtaining from abroad the requisite raw materials, not only the india-rubber from America, the vulcanized india-rubber from England, but also prepared articles, as skins, brought chiefly from France, and steel springs brought from France and England. Some houses do a considerable amount of business by directing their attention to articles of extensive manufacture, not yet established in Italy, such as articles of vulcanized india-rubber, gutta-percha, &c.

Amongst the exhibitors in this class, there are many practitioners of surgery, who in no way ought to appear as workmen, as indeed they are not.

Although many of our makers produce exquisite articles as regards inventive genius, some of which, in steel, are altogether of a superior make, and although some of them are well known, the great houses have not yet developed this branch of trade as much as they ought.

**1445.—1285. ARIANO, GIUSEPPE,**  
*Turin.*

Instruments of high veterinary surgery.

**1446.—1286. BARBERIS, AGOSTINO,**  
*Turin.*

Veterinary surgical instruments.  
Model of newly invented vaginotome; price £2.

Seton needle, with holder and four blades.

Pincers, with five claws.

Pincers, for extracting horses' molars.

Complete set of surgical instruments.  
Hook for extracting roots of molars.  
Several other surgical instruments.

**1447.—1287. BELTRAMI, GIUSEPPE,**  
*Piacenza.*

Surgical instruments.

**1448.—1288. BERTINARA, GIUSEPPE,**  
*Turin.*

Complete case of amputating instruments.

Complete case of cataract instruments.

Complete case of dentists' ivory instruments.

Complete set of instruments.

Various speculums.

Bilateral cystotome (Dupuytren's).

Elastic probes.

Ten workmen employed in the manufacture.

**1449.—1301.\* BRIZIANO, ANSELMO,**  
*Milan.*

Sticking plaster.

Model of arm, to show the method of treating the wound produced by bleeding.

Model of eyes, placed on silk.

Model of feet, to demonstrate the treatment of fleshy nails.

**1450.—1289. COMERIO, BROTHERS,**  
*Brescia.*

Artificial legs.

Various orthopædic instruments.

Apparatus for broken arms.

Rupture trusses.

Elastic bands.

Belts.

**1451.—1290. FERRERO, GIOVANNI,**  
*Turin.*

Rupture trusses of all sorts, simple, double, and of various movements.

The manufactory of M. Ferrero produces £400 worth of instruments, according to the information given to the Italian Exhibition of 1861. It employs 7 men and women, with wages from 10d. to 4s. 2d. per day.

The price of the bandages varies from 8s. to 24s. for simple ones, and 40s. for double ones.

**1452.—1292. GIORDANO, SCRIPIONE,**  
*Turin.*

Uterine pessaries.

**1453.—1293. LOLLINI, BROTHERS,**  
*Bologna.*

Surgical instruments of all sorts,  
forceps, oculist's instruments.

Anatomical instruments.

Knives.

Scissors, lances, &c.

The manufactory of MM. Lollini, which has been opened at Bologna twenty years, under the superintendence of the celebrated surgeons Rizzoli, Alessandrini, Giovannini, &c., has a high repute for the quality and price of the articles. Instruments to the value of £800 are annually made there. It unites to the manufacture of surgical instruments that of fine cutlery and arms.

**1454.—1294. MONTI, E. AND Co.,**  
*Florence.*

Bandages.

Surgical and orthopædic apparatus  
in gum and elastic substances.

The house of M. Monti has existed for a very long time at Florence. In late years it has extended and improved its manufacture of bandages, and greatly increased its importation of foreign articles. It contains a large assortment of all kinds of cloths, and articles in vulcanized india-rubber, gutta-percha, &c., for the use of surgeons and orthopædists. The business is now to the extent of £2,400 annually. The modern manufacture of all kinds of bandages, which, under so many denominations, excels the old, has reduced the price so much that an imperfect hernial truss, with stiff springs, which formerly cost 20 crowns at Florence, is superseded by a bandage with an elastic spring in india-rubber, or in very soft skin, for about one-tenth of the price.

**1455.—1295. OBIGLIO, LORENZO,**  
*Turin.*

Assortment of artificial teeth, and  
sets of teeth mounted in gold,  
silver, gilt, and platina.

There are in Italy skilful surgeons-dentists, who thoroughly understand diseases of the teeth; and there are artists, who attend es-

pecially to the fitting up of the various articles, but the primary materials, such as ivory and enamel, are imported from abroad.

M. Obiglio, one of the most eminent amongst his fellow-labourers, with a business in artificial teeth of £960 annually, imports enamel, india-rubber, hippopotamus ivory, &c., to the extent of £400. The prices given on the occasion of the Italian Exhibition are as follows:—

A set of teeth of finest hippopotamus ivory .....	£12
A set of teeth in silver gilt .....	12
A set of teeth in platina .....	32
A set of teeth in gold .....	40

**1456.—1302.\* OLMETA, ANTONIO,**  
*Cagliari.*

Two pairs of pincers for extracting teeth.

One pair of pincers for cutting teeth.

**1457.—1296. PAVIA (ROYAL UNIVERSITY OF).**

Complete surgical apparatus.

(See Class XXIX.)

**1458.—1299. SERGI, PAOLO, Bes-**  
*sina.*

Gradual eccentric dilator and compressor for the cure of stricture.

The above is a tube split to one-third its length, and capable of being dilated from the inside by means of a metallic stylet, with an enlarged extremity, which is pushed forward, more or less, to separate in a corresponding degree the sides of the tube, and by that means also the walls of the urethra in which the instrument is placed.

**1459.—1300. TUBI, GRAZIANO,**  
*Milan.*

Four orthopædic shoes, to correct irregularities in the feet of horses. They are applied when the animals are resting.

## CLASS XVIII.

## COTTON.

It has been shown that the cotton trade in Italy, as regards its manufacturing development, might become one of the principal sources of national wealth.

For some years past, in Piedmont, Lombardy, and the southern provinces, large sums have been invested in this branch of industry. Mills have been erected, according to the most improved systems of England and France, the looms being purchased in France, Switzerland, and England, and moved either by hydraulic power or steam.

In places where these looms have not been introduced, the spun cotton or yarn is given out to the workmen at their homes. Their employers generally own the frames, which are erected where the workmen live. This circumstance explains the way in which the cotton manufacture has developed itself, at the same time that trades of a more important character have not succeeded.

But these same conditions have impressed a less uniform character upon the cotton trade; for whilst in certain localities, both in the improvement of the machinery and in the good or cheap quality of the articles, nothing is left to be desired, in others rough and very imperfect implements are in use, and the productions cannot, in any point of view, be compared with those manufactured elsewhere. It follows from this that the general position of these manufactures, both as regards their extent and consumption in Italy and elsewhere, is too complex to enable us to give an exact and precise report.

In order to rival the large manufacturing establishments of France, and even those of England, nothing is wanting but larger capital and a little time to recoup the preliminary charges, especially those relating to the cost of machinery, which is one-third more to Italian manufacturers, who are compelled to import it from abroad.

The importance of the cotton trade, spinning and weaving, and works depending upon it, may be estimated for the entire kingdom of Italy, by the following figures:—

1st. Capital sunk in mills, machinery, and different implements...	£16,000,000
2nd. Purchase of 20,000,000 kilogrammes of raw material, valued at.....	1,280,000
3rd. Wages of 200,000 workmen .....	3,600,000
Total fixed and working capital .....	£20,880,000

Proceeding from these generalities to some special information, the spinning and weaving trade in Lombardy is in a flourishing state; as the taxes on machinery not being large, wages not too high, and a duty of a penny per kilogramme being levied on foreign yarn, have secured to our manufacturers a favourable position.

In Liguria, where there are spinning factories in which are made all kinds of cloths and lace, the productions are excellent, but they have had to contend with English competition, occasioned by the recent reduction of duties, which took place at a time when large sums were employed in cotton speculations excited by the American war. Hence it results that out of 850 looms spread over Genoa and the neighbourhood, perhaps not more than 700 are now at work.

In the Bolognese from ten to twelve thousand workmen were formerly employed in the cotton trade. Calico, &c., of excellent quality, and all kinds of coloured cloths, are made there. It is, however, very desirable that the mills and other machinery there should be greatly improved.

The cotton trade thrives in Tuscany, and succeeds tolerably well in Umbria and in the Marches. It is not less active in the south, especially in the Terra di Lavoro, the Principalties, and Calabria. In Sicily it has assumed a remarkable development in the province

of Catania, where the manufactories are distinguished for their excellent woollen and cotton articles, silk and cotton thread, white and coloured quilts of different sizes, waistcoat-pieces, thread, silk, wool and silk, wool and cotton, linen and silk dresses, wool and silk stuff for petticoats, ticks, woollen nightcaps, table linen, &c. A considerable number of workmen are employed in this trade.

The city of Aci Reale, about 18 kilometres from Catania, produces excellent linen cloths, and very fine damask cloths, both of linen and cotton.

The most important of the many advantages of the cotton trade is its moderate price, even after it has undergone several operations. This cheapness alone places its cloths within the reach of a great majority of the people.

## § 1. COTTON SPINNING.

Viewed in its various aspects, the cotton trade embraces three chief operations—spinning, weaving, and dyeing, to which are added the subordinate processes of sizing and printing, but the whole do not improve at an equal rate. The spinning machines, with some exceptions, work up the numbers from No. 3 to No. 40, in woofs and warps, plain and twisted; but we must not suppose that because one kind of cotton cloth is well spun, that therefore all kinds must of necessity be the same, inasmuch as everything depends upon the machine employed, for it is just as difficult to spin an inferior sort of yarn as it is one even above No. 40.\*

In 1860 there were not fewer than 500,000 spindles at work in the Italian factories; the quantity of raw material employed reached about 20,000,000 kilogrammes, a part of which was the produce of the Neapolitan and Sicilian provinces, where the extension of the culture of cotton would be of immense benefit to Italy.

The first mill for spinning Lombardy cotton was established in 1810, by the house of MM. Ponte de Gallarate, Brothers, on the banks of the river Olona, since which more than a dozen mills have been established there. There are now in Lombardy 33 mills, with 166,000 spindles, producing annually 1,145,113 packages, making an average of 5,200,000 kilos of yarn No. 13. This, nevertheless, does not suffice for our consumption, and we are compelled to have recourse to a foreign supply, drawn principally from England. The numbers imported are of the finest sorts, as No. 30 to 40, for plain thread, and Nos. 30, 32, 40, 60, &c., for the double-headed twist. There is no inducement to produce that description in this country, even if the manufacture of it were possible, at least not up to the number 40. In fact, the Lombard mills having only a very limited motive power, they are compelled to use economy in their machinery, which on account of heavy duties and freight are rendered costly. They spin exclusively American cotton, easy to work; and instead of English machines, which are too heavy for their present purpose, they have adopted the Swiss and Alsace machines, although less perfect. The mill owners understand, however, that to enable them to compete with English manufacturers, they must have recourse to machinery with the most recent improvements, as well as the system of mixing different qualities of cotton. Many establishments have displaced their turbines by steam engines, by means of which the production having been brought again to its normal level, the cost of production will not be so subject to sudden variations.

In 1855 there were in Milan 15 cotton mills, with 69,286 spindles. At present there are 20, having 104,302 spindles.

The number of hands employed in the Lombardy mills are about 4,900, many of whom are children, who receive about 5d. for a day's work of from 12 to 13 hours; the women receive 6½d. to 7½d.; and the men from 10d. to 1s. 3d. for the same.

In 1840 there were in Piedmont 110,000 spindles, the number of which has greatly increased; and Liguria, from 1850, might reckon 95,000 spindles.

In Tuscany spinning was introduced by M. Paddrèdi, of Pisa, in 1842, and it has been since greatly developed; but it has not been so much followed as weaving. There was imported into Tuscany, in the five years from 1851 to 1855, cotton yarn to the extent of about 6,105,000 kilos. (See Marriotti's Cotton Trade in Tuscany).

In the southern continental provinces there are six mills, which produce annually 28,000 metrical quintals of cotton yarn.

## § 2. COTTON WEAVING.

Weaving keeps pace with spinning; but it has often outstripped it, and now exceeds it in point of production. Italian weavers, at the present time, devote but little attention to the more costly productions, directing attention mainly to the more satisfactory demands of a

\* See an excellent work:—*Delle condizioni dell'Italia nell'Agricoltura, nelle Manifatture, e nel Commercio, in confronto dell'Inghilterra e della Francia, e della libertà di commercio*, p. 109. *Studi dell'Arc. Cav. Vincenzo Rossi*. See also Class IV.

large body of consumers. These manufactures comprise calicos, dimities, twills, madapollams, waistcoatings, bed-ticks, coarse woollens, &c.

Damasks, carpets, and other kinds of figured stuffs, furniture, and dresses, are manufactured in Piedmont and Lombardy. The making of cotton velvet is circumscribed, foreign importation having too many advantages over the home manufacture.

The number of looms in Italy exceeds 100,000, and amongst them are a great many power-looms, but which, in spite of their superiority, have not done away with the use of the handloom. The reason is that cheapness does not always correspond with good quality, and that cloths made by hand, especially the common sorts, while they are made at a cheap rate, suit the tastes of the country.

Notwithstanding the 1,160 power-looms and 4,858 hand-looms, employing 7,668 work-people, produce 1,161,200 kilos. annually, the weaving-trade has assumed a high position in the country, where it is estimated there are about 60,000 hands engaged in the making of cotton stuffs on account of houses established in Lombardy, principally in the environs of Busto, Arsizio, Gallarate, Legnano, Monza, Dosio, and Tradate. In 1855 it was estimated that in the Milanese there were about 15,327 hand-looms, the greater part distributed amongst the peasants of the neighbourhoods of Monza and Gallarate. At present this number has increased, but it is not known to what extent; we have only positive data respecting 800 power-looms, which have been erected in six or seven establishments.

The provinces of Bergamo and Brescia, on the other hand, produce a very important contingent. The articles most in demand are fustian, calico, quiltings, Perpignans, coloured cotton stuffs, damasks, &c., all for home consumption. Exportation has not hitherto been contemplated, and their efforts are confined to overcoming foreign competition in the recently annexed Italian Marches.

It is difficult to furnish exact statistics of a trade in the houses of so many. We have before said that the total production in Lombardy of say, 5,200,000 kilogrammes, is consumed in the country, about 2,000,000 more are imported; it may, therefore, be conjectured with some probability that weaving in Lombardy uses up at least seven millions of kilogrammes of cotton yarn, No. 16 to 18.

In Piedmont the cotton manufacture, especially weaving, is not less flourishing; in 1840 there were fifteen thousand looms, with a produce of £600,000, which rose, in 1857, to £1,200,000.

In Liguria there are about 1,200 power-looms, 250 having been added during the last few years, and there has been an addition of 150 circular looms for knitting-work, embroidery, lace, &c., irrespective of the hand-looms dispersed over the country.

Cotton weaving was introduced into Tuscany by a Frenchman, M. Dumas, who brought it to Pisa in 1826, whence it spread very rapidly over the district, as also in Leghorn, Prato, San Sepolcro, &c., and in the Maremmas, so that between Empoli and Pisa, in a range of about forty kilometres, 8,500 persons find constant employment.

Amongst the various cloths extensively manufactured, are the checks (*rigatini bordatini*), to such an extent that, from 1851 to 1855, it might be estimated that 4,400,000 kilos. of cotton were used up in weaving in Tuscany, in addition to an importation of white and printed cloths of near one million.

In the southern provinces there are seven establishments employing power-looms, which produce 170,000 pieces of cloth, worth £170,000, and four others for printed cotton, which produce goods to the value of £260,000.

#### MISCELLANEOUS COTTON MANUFACTURES.

Articles connected with bonnet making, gauze, galoons, ribbons, and various kinds of lace, deserve some attention. It is computed that in the Milanese there are 200 looms devoted to the making of knitted work, and that 1,000 workmen are employed in cotton embroidery. In various places in Liguria, lace making (*pizzi*) employs a large part of the population. They are now about to introduce machine-looms, chiefly for the making of knitted work, a productive branch of industry in the ancient provinces of Piedmont.

The progress already made does not, however, allow us to compete with the foreigner, either in quantity or quality, and importation is not yet in proportion to our wants. As Italy cannot be suddenly brought to a state of perfection, its consumption is limited to articles absolutely indispensable.

### § 3. DYEING, PRESSING, AND PRINTING.

The Lombard manufactories have been less successful in fixing colours on a large scale,—which is the only one practicable in the getting up of these cloths, the colours and designs of which depend altogether on changes of fashion—than in dyeing, properly so called, although the improvements in this are highly satisfactory so far as the processes and the profits are concerned.

There are four houses in Lombardy which produce the fine red called Turkey red. They could easily produce 500,000 kilos of this valuable colour, if the demand were equal to it, and the Levant would receive the product of Italy rather than that of Germany, to which country hitherto a preference has been given. In the town of Monza twenty manufacturers are exclusively employed in the production of blue twist, besides other houses which produce other different colours.

For sizing cloth we have two large establishments, fitted up in the English manner, and which for some years have relinquished the old mode of hand-sizing.

For calendering and finishing the work there are establishments which use steam, and into which the most recent improvements have been introduced. If, as we hope, the consumption of Italy should increase, Lombardy is able to satisfy every requirement in this respect.

There are dyeing works in Tuscany and in the south, which carry on a trade to the extent of £42,400.

#### COTTON YARN.

##### 1460.—1545. BOSIO, FELICE AND Co., *Castello di Lucento (Torino)*.

Spun cotton of various colours.

Per packet.

No. 28. Cold blue, 1s. 8d.

„ Sky blue, 2s. 6d. to 4s. 0d.

„ Blue . 5s. 0d. „ 6s. 6d.

No. 12. . . . . 4s. 6d. „ 6s. 8d.

The packet weighs 4.50 kilos.

The establishment of M. Bosio, situated near Turin, has been at work for the last 16 years. It employs 30 to 35 workmen, whose daily wages are about 1s. 3d. to 2s. 1d. His production amounts to 770,000 kilos. of yarn, dyed blue of various shades, with indigo, perfectly fixed, and always brilliant.

##### 1461.—1311. COBIANCHI, PIETRO AND SON, *Intra (Novara)*.

Spun and twisted cotton of various numbers.

The cottons are:—

Walter, No. 20, 24, 30.

Mobile, No. 30, 40.

Re-twisted, No. 32 with two threads.

There are from 650 to 700 persons employed, with wages of from 5d. to 2s. 2d. per day.

##### 1462.—1547. FOLETTI, WEIS, AND Co., *Milan*.

Many samples of spun and dyed red cotton, called Adrianople.

##### 1463.—1312. HUBER AND KELLER, *Pisa*.

Spun and dyed red cotton.

##### 1464.—1313. LUALDI, ERCOLE, *Milan*.

Spun cotton.

The works of M. Lualdi are at Sant' Ambrogio, province of Como, and at Santa Eufemia, province of Brescia. The spinning works, which have been adopted and combined with the Escher machines of Zurich, embrace six thousand five hundred spindles, set in motion by water-power. It employs 500 men, women, and children, whose wages average 10d. for the first, 6d. for the second, and 4d. for the third.

The raw material is American and Surat cotton, which is worked up into one thousand packages of yarn, No. 19.

##### 1465.—1324. WONWILLER, D. AND G., *Naples*.

Collection of spun cotton.

#### COTTON FABRICS AND VARIOUS CALICOS.

##### 1466.—1660. ALEPPI, LUIGI, *Parma*.

Cotton drawers without a seam.

##### 1467.—1307.\* ALESSANDRIA (PENITENTIARY ESTABLISHMENT OF).

Stuffs in thread and cotton.

Do. imitation gold and silver.

##### 1468.—1310. CANTONI, COSTANTE, *Milan*.

Cotton fabrics.

Fustians, smooth and rough, white and coloured.

Perpignans and thick rough fustians, white and coloured.

Domestics, prints, calicoes, dimities, unbleached linen for handkerchiefs, &c.

The productions of M. Cantoni, consisting of various cotton stuffs, white and coloured, the prices of which vary from 3d. to 1s. 1d. the metre, supply numerous establishments at Castellanza, Legnano, Gallarate, Sacconago, Canegrate, Busto Arsizio, and Parabiago, in the province of Milan. The work is performed by regulated power looms and by hand looms; the moving power consists of hydraulic wheels and steam engines, of an aggregate power of 160 horses.

The workmen employed are upon an average, 800 men at 10d. per day; 750 women at 7½d.; and 100 children at 5d.

The material employed is the strong cotton of America, to an extent of 2,000 bales, or 400,000 kilos., worth about £36,000. The cotton is worked up into 73,000 pieces of 45 metres in length, having a total value of £100,000. The direction is composed of Messrs. Eugenio Cantoni, practical director; Clemente Guzzi, consulting engineer; Giuseppe Beck, superintendent of the spinning works; Cosimo Saccanaghi, superintendent of the weaving works; Costanzo Taschini, superintendent of the dyeing and carding; and Giovanni Boardman, superintendent of the power loom-weaving.

**1469.—1308.\* CALAMINI AND Co., Pisa.**

Various cotton cloths.

**1470.—1326.\* CAMPANA, ISIDORO, Milan.**

Various cotton cloths.

**1471.—1309.\* CREMONCINI, ARTEMISIA, Florence.**

Various cotton cloths.

**1472.—1320. CARINA, DINO, Pisa.**

Cotton fabrics manufactured in the territory of Pisa.

Instruments used in the manufacture.

**1473.—1328.\* LAZZARI, ROSA, Lucca.**

White cotton gauze.

**1474.—1314. MILAN (ROYAL CHAMBER OF COMMERCE OF)**

Samples of cotton velvet.

**1475.—1315. MODENA (SUB-COMMITTEE OF)**

Cotton cloth, with coloured threads, called *Bigantini*. Special manufacture from the communes Sassuolo and Fiorano.

**1476.—1316. MORELLI, FRANCESCO, Florence.**

Tissues of coloured cotton for coats and trousers.

**1477.—1327.\* HOZ AND FONZOLI, Terni.**

Cotton fabrics.

**1478.—1317. OSCULATI, PIROVANO AND Co., Monza (Milan).**

Trouserings, in cotton.

Linen.

Damask.

Ribbons.

Cotton, wool, linen, and swans-down fabrics, mixed and unmixed.

These cloths are manufactured partly at Monza, where the manufacturers reside, and partly at Centamero, about 20 kilometres from Monza, by means of the common fly loom, to which, in certain cases, the regulating and Jacquard looms are added, both being supplied by the firm of the exhibitor. This weaving having during a long period been executed by the common looms of the country, power looms are not required. The workmen labour at their own homes, and their wages are proportioned to the quantity and quality of their work. 300 men, 200 women, and 100 children, are employed. The average wages are—daily, for men, 1s. 8d.; women, 7½d.; children, 3½d.

**1479.—1318. PERSICHETTI, SALVATORE, Ancona.**

Assortment of cotton cloths for sails.

**1480.—1319. PIATTI AND Co.,**  
*Piacenza.*

Cotton fabri.

**1481.—1321. SCHLAEFFER,**  
**WENNER, AND Co., *Salerno.***

Cotton fabrics, printed.

Ditto. rough.

**1482.—1322. STEINAUER, G. A.,**  
*Chiavenna.*

White and coloured cotton wadding.

**1483.—1323. THOMAS, ACHILLE,**  
*Milan.*

Cottons for shirting, &c.

Fustians.

Mixed cotton and woollen stuffs.

This manufacture is established at Milan, Porta Tenaglia, No. 5. The works have a steam engine, in the working of which English coals are used. The looms are self-acting, on the English principle; they can weave 160 woofs per minute. Young women of from 18 to 20 years of age are employed, whose wages averages from 4d. to 6d. per day.

The raw material consists of cotton yarn and twist, partly English and partly Italian. The annual production is about 400 metres.

**1484.—1325. ZEPPINI, FRANCESCO,**  
*Pontedera (Pisa).*

Cotton coverlids.

Do. Jacquard-wove.

## CLASS XIX.

### FLAX AND HEMP.

Independently of flax and cotton, hemp is used for the weaving of cloth, either for ordinary use or for sail and packing cloths.

According to the Statistical Report of 1857-8, the production of raw hemp had risen in Italy, in round numbers, to 40,000,000 kilogrammes, thus divided:—

Bologna, Ferrara, Cesena	...	...	...	...	20,000,000 kils.
Piedmont (old province)	...	...	...	...	3,500,000 "
Venice	...	...	...	...	1,500,000 "
Lombardy, Umbria, Marches (Ascoli especially), Tuscany,	...	...	...	...	8,000,000 "
Neapolitan provinces	...	...	...	...	7,000,000 "
Total	...	...	...	...	40,000,000 "

If we value this production at an average of £2 17s. the 100 kilogrammes, it gives a revenue of about £1,120,000, one-half of which applies to Bologna, Ferrara, and Cesena.

Nevertheless these figures do not perhaps represent in their aggregate amount the whole production of hemp, as competent valuers give 10 millions of kilogrammes to Piedmont, and quite as much to the Neapolitan provinces. The amounts given for the provinces of Bologna and Ferrara may be deemed exact, and it will be observed that the latter amounts to one-half

of the whole Italian production, being under two-thirds of that of France, as estimated by M. Moreau de Jonnes, at 67 millions of kilos. In the provinces of Bologna and Ferrara about 600 kilos of hemp are produced per hectare, but some growers obtain as much as 1,000 to 1,500 kilos.

Of the total produce there are exported to Switzerland, Germany, France, England, Spain, and Portugal 16 millions of kilos, that is to say 13 millions of raw hemp, 3 millions of combed hemp, and 1 million of cordage. The remaining 24 millions supply the inland consumption and that of Rome and Venetia.

The culture of hemp, in order to be productive, requires numerous special conditions, as regards soil, water-courses, &c., which very much restricts its limits, and localises it in particular places, sometimes very remote from each other.

In the north of Italy the provinces of Bologna and Ferrara are the focus of the hemp production; it again appears in the Modenese, especially in the district of Finale, near the province of Ferrara; in the districts of Mantagnana, Codogno, Rovigo, Venetia, where it is said a Bolognese introduced it in the 16th century; and finally at Cesena, and in the provinces of Ravenna and Forlì.

In Lombardy, Tuscany, and the mountainous parts of the Apennines the production is not very considerable. The territory of Ascoli, Spoleto, Orvieto, Viterbo, in the Marches and Umbria, and the provinces of Naples and Terra di Lavoro in the south, stand second as regards the production of Upper Italy.

The provinces of Bologna and Ferrara are not only the centre of the hemp production, but also those of the best methods of cultivation; they yield the best produce, and amongst them the giant hemp (*canopa gigante*), which was so warmly approved in the International Exhibitions of 1851, 1855, and that of Italy in 1861.

The Bolognese hemp is distinguished, by its whiteness, fineness, suppleness, brilliancy, and the divisibility of its fibre, from all other hems of the Ferrarese, which, being of long staple and more tenacious, is better adapted for cordage. The Bolognese hemp, which may almost rival flax, resembles that of Cesena and that from Venice, Piedmont, and the south. M. Professor Luigi Botter conceived the idea of collecting for the Italian Exhibition of 1861, everything which related to the culture of hemp, by forming a large collection of soils, manures, machines, and products, illustrated by a descriptive table; and that collection was honoured by a jury medal, accompanied by an expression that the collection itself, reduced to its most important articles, should be sent to the Exhibition of London. This collection has in fact appeared, and the articles may be divided into the following groups, reserving the names of the private exhibitors.

## SECTION I.

### CULTIVATION OF HEMP (CANAPICULTURE).

#### 1. SOILS, DISPOSITION OF THE FIELDS, AND MODE OF CULTIVATION.

##### 1485.—1085. BOLOGNA (AGRICULTURAL SOCIETY OF).

Model, in relief, of a hemp field.

Drainage material.

Samples of hemp soil.

The culture of hemp, as well of herbaceous plants in general, is agreeably combined, in the Bolognese, with the cultivation of trees, the vine and the mulberry, which, planted in straight and regular lines, give shelter to the crops; great care is taken in the management of the water and its supply, and the various contrivances, as well as for the cultivation, divided into wheat, hemp, and fodder.

Although the lands of the Bolognese are alluvial, hemp thrives on certain soils with stable manure only; on others, manure of a different kind must be added; and there are soils on which hemp will not thrive at all.

#### 2. IMPLEMENTS USED IN THE CULTIVATION OF HEMP.

##### 1486.—897. BOTTER, Prof. LUIGI, Bologna.

Common spade.

Sub-soil spade (*Vanga da ravaglio*).

Dombasle-Botter plough.

**1487.—1083. BERTELLI, LUIGI, Bologna.**

Sub-soil plough (*aratro ravagliatore*).

**1488.—1090. CERTANI, ANNIBALE, Bologna.**

Certani's sub-soil plough (*aratro ravagliatore Certani*).

The *ravaglio* is a sort of tillage practised in the Bolognese; when performed by hand, the spade is dug into the furrows opened by the plough and the clod is thrown back upon the raised earth and turned over. For the common spade has been substituted a sub-soil spade (*vanga da ravaglio*), and, finally, the ploughs of M. Bertelli and of M. Certani, (*aratro ravagliatore*), which must not be confounded with the ordinary sub-soil plough (*aratro repuntatore*), nor with the ploughs of M. Bonnet, or those of Astolfi, Bertelli, and Zucchini, already known and practically applied.

As regards the effect of M. Certani's implement it comes upon the land after the common plough, and cuts a furrow about 2 feet deep, with clods of about a foot in width; it raises them up, throws them over, and crushes them, and ploughs 550 feet in length in eight minutes. The machine, in wood, lined with iron, costs £3 5s. at Bologna.

All the preparatory labour, whether performed by these implements or not, is of the greatest importance, the crop always corresponding to the care bestowed upon it.

Usually, in August, after the harvest, the land is ploughed, to bury the stubble; then a second ploughing takes place, followed in November by spade husbandry or by the *ravaglio*.

These various improved implements are being substituted for the old ones; and, above all, the Dombasle-Botter plough supersedes the common plough.

**3. MANURE AND IMPLEMENTS FOR ITS CARRIAGE.****1489.—897-1087. BOTTER, Prof. LUIGI, Bologna.**

Drawing pumps.

Seed cakes.

Seeds of plants for *sovesce*.

The Arabian pump, modified by M. Angelo Sonda, is of great utility for liquid manure.

Linseed oil-cakes are excellent as supplementary manure; the turnip and colza are

also used, and in Verona castor oil cakes, the produce of the various establishments in which the oil is extracted.

Beans, turnips, and colza are employed for green manure, known as *sovesce*.

A prejudice, which happily is being dispelled, connected the culture of hemp with marshy ground, even going so far as to believe that it was necessary to add straw and even rushes to the common stable manure, in order to increase its power.

The refuse of the stable has been always considered as normal and necessary manure; and green manure, oilcake, horns, & auxiliaries in some localities.

**1490.—1113. DONNINI, SAVERIO, Bologna. (See Pizzardi.)**

Supplementary manure, birds' excrement, &c.

Machine for chopping the horny matter used as manure, or horn-chopper (*Rotino da Rizza*).

M. Donnini prepares large quantities of manure from the excrementitious matter of animals, dunghill fowls, pigeons, &c. He sells 550,000 kilos. annually.

M. Giovanni Cocchi, assisted by M. Barbieri, has invented a machine for dividing the horns and hoofs, &c., after being softened by steam. The machine exhibited belongs to the establishment of M. Pizzardi; it can work up from 400 to 500 thousand kilogrammes of horn yearly, but in consequence of the want of water to work the machine during some months of the year, they seldom use more than about 200 thousand kilogrammes.

**4. HEMP-SOWING.****1491.—987-1087. BOTTER (Prof. LUIGI), Bologna.**

Seed plough.

**1492.—1085. BOLOGNA (AGRICULTURAL SOCIETY OF).**

Fagnoli sower.

Prandi sower, model of.

Instrument for covering the seed.

Husbandry, whether by spade or plough, is carried on in autumn; it is wrong to postpone it till spring. The soil before the sowing is levelled by a large levelling instrument (*spinatorio scalone*), drawn by oxen, and afterwards divided into beds.

The quantity of seed used in sowing is about 70 litres per hectare. It is very important that it should be the last year's seed, as it speedily loses the power of germination. This seed is scarcely ever used for the extraction of oil.

The implements suggested to set the hemp seed cannot properly, although very simple, be adopted in cultivating upon a large scale.

##### 5. WORKS AND OBJECTS RELATING TO HEMP-GROWING.

###### 1493.—895. BOLOGNA (AGRICULTURAL SOCIETY OF).

Preparation of hemp affected by *Botrys silacealis*.

The *Botrys silacealis*, called Bigatella, in certain years attacks all the hemp-grounds more or less, and it is more injurious in heavy lands than in any other. They gnaw the bark in order to get at the inside; they destroy the fibres of the wood, and the plant becomes enfeebled and droops. Thus deformed, it is called *scavezzon*. The *altiches*, or hemp fleas, gnaw it when it is young, and seriously damage it.

###### 1494.—897, 1087. BOTTER, Prof. LUIGI.

Small mattock for rooting out weeds, which afterwards are to be got rid of by hand.

Specimen of hemp affected by disease.

The capped hemp (*canapa incappucciata*) is affected with a disease, which causes its leaves to twist on itself, preventing the development of the plant in its early stage. The disease appears to have some connection with heavy rains falling upon calcareous soils.

In the hemp called green-footed hemp (*calzata verde*) the bark grows yellow at the lower extremity of the stalk, and splits; it adheres strongly to the wood, and is not detached in the soaking; the oakum is thereby increased, and the hemp correspondingly diminished.

In the disease called soddened-foot (*calzata macerata*) the stalk is attacked by Orobanche. The *Orobanche ramosa* (Scalogna) of the hemp, as well as its congeners, is a parasitic plant, which every year extends its fatal influence. Great efforts have been made to get rid of it, but they have not as yet succeeded. In 1853, Prof. Botter discovered a new parasite, the *Spmaria cannabis*, which this year has appeared in some places. Prof. Bertoloni has

examined it, and considers it belongs to a new genus, proposing to call it *Acheromorpha cannabis*.

###### 1495.—1114. ROSSI, ALESSANDRO, Bologna.

Clod crusher.

##### 6. GREEN HEMP, AND APPARATUS FOR RETTING.

###### 1496.—883. AVENTI, Count FRANCESCO, Ferrara.

Hemp obtained in marshy land, dried by hydrophoric machines. Collection of hemp.

###### 1497.—885. BARATELLI, BARON, Ferrara.

Green hemp.

###### 1498.—943. PASI, GIOVANNI, Ferrara.

Hemp seed.

Hemp fibre (*gargiolo*), obtained from hemp cultivated on the farm of S. Nicolas, near Ferrara.

###### 1499.—945. PAVANELLI, GIUSEPPE, Ferrara.

Picked hemp, from Medelana farm. Hemp stalks, do. do.

M. Pavanelli was the first to introduce the hydrophore machines for drying. He has now three establishments, two steam-mills, a work-shop for repairing machines, and many other appliances for agricultural purposes.

###### 1500.—268. BERGAMI, PIETRO, Ferrara.

Hemp seed.

###### 1501.—893. BERNADUSI, AURELIO, Ascoli.

Samples of green hemp.

###### 1502.—894. BIAVATI, PIETRO, Crevalcore (Bologna).

Samples of green hemp.

**1503.—1085. BOLOGNA (AGRICULTURAL SOCIETY OF), and BOTTER (PROF. L.)**

- Models of soakers with fixed guides.
- Do. do. free.
- Do. do. with stones.
- Model of instrument for squaring the stakes.
- Model of instrument for beating the stakes.
- Model of instrument for the frames.
- Do. do. removing the stakes.

**1504.—897. BOTTER. PROF. LUIGI, Bologna.**

- Samples of female hemp (*canapacci*) for ropes.

*Canapacci* is the terms applied to the female plants of the hemp, which are selected from amongst the larger plants, and left longer in the field, in order to ripen the seeds.

- Larger samples out of the hemp field.
- Table (*panconata*) for levelling the hemp.
- Instruments for beating the hemp.
- Arabian pump, with 4 valves, for emptying the retting ponds.

**1505.—903. CERTANI, ANNIBALE, Bologna.**

- Hempseed, from the property of S. M. Napoleon III.
- Green hemp, prepared by retting, from the same locality.
- Hemp coiled, from the same locality.
- Raw hemp, in balls.

**1506.—912. FERRARA (ROYAL CHAMBER OF COMMERCE OF).**

- Hemp seed.
- Hemp stalks, of an extraordinary length.
- Rough white hemp.
- Do. do. cut at the foot.
- Fine hanks.
- Cloth for sails.
- Ropes cordage for ships.

At the Exhibition of Paris of 1855, the Ferrara hemp was considered superior to every other for sail cloth and for ships' cordage. Hemp grows in the Ferrarese to a prodigious height, and the Chamber of Commerce above-mentioned has specimens of stalks of 16 to 30 feet in height.

The specimens from Ferrara deserve particular mention, especially those which were obtained from the marshy low-lying lands drained by the hydrophores of Count Francesco Aventi, M. Giuseppe Pavanelli, and M. le Baron Boratelli, and which are remarkable for their colour, length, and the strength of their fibre.

The cloth for sails received in 1851 a prize in the General Exhibition of London. The cables are made with great care and with the strongest hemp. The ropes called *merlins* had the prize in the provincial Exhibition of 1857.

**1507.—912. FERRARA (AGRICULTURAL SCHOOL OF)**

- Green hemp.

**1508.—986.\* FORLÌ (SUB-COMMITTEE OF)**

- Hemp.

**1509.—930. MERCATILI, Count MICHELE, Ascoli.**

- Hemp in the sheaf.

**1510.—937. PACIFICI, Count DAMASO, Ascoli.**

- Hemp in the sheaf.

**1511.—956. SALADINI, Count M., Ascoli.**

- Hemp in the sheaf.

**1512.—960. SACCONI, Count E., Ascoli.**

- Hemp in the sheaf.

The process of retting—the most important, the most difficult, and the most laborious of all the operations with hemp—is performed in lakes, ponds, and running waters. In the centre of the hemp cultivation artificial pits are made (*maceratori*), several models of

which are exhibited. Almost every hemp-grower has his own pits, excavated in the lowest part, so as to collect the rain-water.

In works near rivers or canals, the water in the pools is changed when the process of maceration has made some progress; it is thereby easy to regulate the fermentation, and render the water more clear between two immersions.

Of the processes followed, that of the pools or pits is the best. There is less danger of deteriorating the stalk, and greater suppleness and fineness of the fibre are secured.

The quality and quantity of the water, the temperature, the quality of the hemp, and the care of the grower, contribute essentially to the success of the soaking process.

To secure this with the greatest uniformity possible, it is necessary for the hemp itself to be assorted into sizes, which is done by an operation inaptly called drawing, (*tiratura*).

The water must also be drawn from the pits, and changed, to prevent the matter formed during the maceration from being deposited. This operation is effected by means of different instruments, among which may be noticed the Arabian pump, invented by M. Botter.

A great many persons are employed in this work, and the hemp is macerated in large quantities. The earth of the soaking pits is carried to the fields, to furnish fertilising matter.

The health of the Bolognese proves that the miasma which infect the air in the neighbourhood with an excessively nauseous stench, has nothing deleterious in its nature, either to men or animals.

## 7. HEMP BEATING (DICANAPULAZIONE). SUPPLEMENTARY PROCESSES.

### 1513.—1085. BOLOGNA (AGRICULTURAL SOCIETY OF).

Crushing machine (*dicanapulatrice maciulla*), made by a peasant, of the name of Bernagozzi.

### 1514.—896. BONORA, ALBINO, Ferrara.

Rough hemp in bales.

### 1515.—897. BOTTER, Prof. LUIGI, Bologna.

Board and staff to beat the hemp.  
Small common brake.  
Large brake.

### 1516.—902-894. CERTANI, AN- NIBALE, AND BIAVATI, PIETRO, Bologna.

Balls of hemp bound up (*ammarrate*).

### 1517.—1111. PAGANONI, ADAMO, Ferrara.

Machine complete for crushing hemp (*dicanapulatrice*).

The various implements here indicated are used to separate the wood from the fibre of the hemp after steeping. M. Botter calls the entire operation by the name of *Dicanapulazione*, and calls the wood of the hemp, separated from the bark, *Canapulo*.

The first operation (*Scavezzatura*), which crushes the wood roughly, must be distinguished from the second, which beats it effectually, and detaches it from the fibre; this is done by the brake, and is called *maciullatura*, from *maciulla*, which is the Italian word for brake.

The *Scavezzatura* is usually performed by animals or by machinery, and for this purpose a machine, which they call a fan (*ventaglio*), cheap in its construction, but not durable, is used. The machine of M. Paganoni, No. 1517, is a great improvement; the price of it is about £9.

The beating is frequently performed by hand, with the common brake, but there are also more complicated and variously constructed machines, moved by animals; they are, of course, used after the operation of crushing.

After these operations there is the straightening of the fibres, which is done by means of a long-toothed comb; the ends of the fine qualities of the Bolognese are then cut; after which the practical operations of the grower are completed by packing it according to its quality and then binding it.

## 8. HEMP DRESSING, BY MEANS OF CHEMICO-MECHANICAL PROCESSES.

### 1518.—QUADRI, ENRICO, Naples.

Raw hemp for ropes.

Hemp worked dry, that is, without steeping.

Combed and washed hemp.

Raw hemp for ropes, worked dry, that is, without steeping or preparation.

M. Quadri is the only one in Italy whose machines can extract the thread from green hemp, that is, from hemp not steeped.

Dickson's machines resemble those of Christien; but those of Quadri differ from both. They consist of two sets of fluted cylinders, placed longitudinally in pairs, one over the other, which crush the wood of the hemp which passes between them.

Each machine is composed of from 16 to 42 cylinders, according to the width of the grooves, which are very numerous. The hemp is first made to pass under the large grooves and afterwards under the smaller.

Prepared in this manner the hemp is very serviceable for ropes, as they absorb more tar. By this method of preparation 25 per cent. of fibre is obtained, while in the ordinary process of steeping only about 15 or 16 per cent. is obtained.

The combed hemp of M. Quadri has un-

dergone the action of sulphur, and by this means has been slightly impaired.

The Quadri machinery is put in motion by a steam engine of 5 horse power, and the combustible refuse (the wood of the hemp), yields excellent ashes, rich in potash.

The establishment is capable of working up a million of kilogrammes of raw hemp annually; but at present only 25,000 kilos pass through their mills.

By eleven hours' work, 2,800 kilos of fibre can be produced, and each machine can give 700 kilos of fibre in 12 hours.

Notwithstanding the elements of prosperity which this establishment enjoys, it encounters obstacles in the prejudices of the peasantry.

The Quadri machines would be an immense benefit for the province of Naples and of the Terra di Lavoro, where the hemp, as we have already said, is badly steeped, in the lake Agnano and in the marshes of Maddaloni.

## SECOND SECTION.

### HEMP MANUFACTURE (*Canapificio*).

#### § 1. WAREHOUSING.

Warehousing embraces—1st, the selecting and picking, which produces six different qualities of hemp, called *Londrine*, and a similar number of common, or cordage sorts. The operation is performed by the pickers (*Scglitori*). 2nd, The packing and pressing the bundles, weighing 100, 250, and 300 kilos, and wrapping them in waxed cloths for dispatch to a distance. This operation is performed by means of common or hydraulic presses; the pressing facilitates the carriage by diminishing the size, and gives to the hemp a greater brightness and flexibility.

#### § 2. COMBING AND PREPARING THE HEMP IN SMALL BUNDLES.

The business of the comber, who reduces the raw hemp to a finer fibre, generally called *gargiolo*, is carried on at Bologna, Ferrara, Cento, and in several other places in Italy, either in private houses or in special buildings, amongst which at Bologna those of MM. Facchini have a high character; they employ 120 to 140 workpeople during the summer in packing, and about 320 or 340 in making the small bundles or hanks.

The province of Bologna produces annually 1,800,000 kilos. of combed hemp, and Bologna carries on with Tuscany a very extensive trade in hemp combed of the first quality. It is sold in bundles of 25lbs., a quantity which in Italian is called a weight (*peso*), which fetches from £4 16s. to £4 18s. 6d. the 100 kilos.

1519.—974.\* BERTERO, ANTONIO  
AND GALLA, *Carmagnola*  
(*Turin*).

Hemp for ropes; price £4 17s. 8d.  
per 100 kilos. at Genoa.

Ships' rigging.

1520.—980.\* CASERTA (SUB-  
COMMITTEE OF).

Rough hemp of St. Nicholas.

Refined hemp, long, 1st quality.

Combed hemp, short, 2nd quality.

Stalk of this hemp.

Flax unprepared.

Stalk of the flax.

Riga flax cultivated at Caserta.

Wild flax of Caserta.

Stalk of the flax.

**1521.—902. CAVALIERI, PACIFICO, Ferrara.**

Hemp.

Crushed hemp.

**1522.—909-1098. FACCHINI, BROTHERS, Bologna.**

Hemp in various hanks.

Machine for softening hemp.

Samples of softened hemp.

Combs.

The Facchini machine, invented by M. A. Franchini, a mechanician of Bologna, and constructed in the factory of M. Reati, can be worked by hand or by animals. It consists of a set of cast cylinders, through which the hemp is pressed; there are many other machines, more or less powerful, but they are less effective than the above.

The firm of Facchini produces also the hemp called *trada*, which is almost all exported to Germany, where it is made into leggings and saddlery; this house dispatches annually from 15,000 to 20,000 bundles of raw hemp and 7,000 or 8,000 bundles of combed.

**1523.—912. FERRARA (CHAMBER OF COMMERCE).**

Fine combed hemp.

**1524.—921. GULINELLI, Count GIOVANNI, Ferrara.**

Rough hemp, from his farm of Abbey of St. Nicholas.

**1525.—924-1106. MACCAFERRI, LUIGI, Bologna.**

Machine for softening hemp.

Hemp stalks.

Samples of hemp, softened by the Maccaferri machine.

Hanks of combed hemp.

Samples of softened hemp.

The machine of M. Maccaferri for softening hemp completely deprives it of its last remnant of hard matter, which renders the fibre stiff and rough to the touch. It is a truncated cone, grooved, fixed at its smaller

end in the centre of a frame in stone, upon which it revolves on its own axis and crushes a layer of raw hemp placed beneath.

The works of M. Maccaferri have been established more than 50 years. He carries on at this time a trade of 200,000 kilos. of hemp, either of *londrines* or cordage. He sends abroad about 75,000 kilos. of hemp, combed at his own place, without reckoning 40,000 other kilos. which he purchases in small parcels from the *gargiolai*—private combers of Bologna.

The bundles exhibited by M. Pasolini, of Imola, are worthy attention.

The most important of the manufactures of combs, the principal implement used in combing, is that of M. Pietro Cevenini, of Bologna, who makes 800 to 1,000 of these implements yearly, at the price of from £1 1s. to £3 5s.

**1526.—940. PALLOTTI, CARLO, S. Giuliano di Lepino (Campagna).**

Hempseed.

Combed hemp,

Bruised hemp.

**1527.—941. PALLOTTA, SALVATORE, Orvieto (Perugia).**

Hemp prepared for home consumption. Price 2s. 6d. the kilo.

**1528.—944. PASOLINI, GIUSEPPE, Imola.**

Hemp combed in small bundles.

**1529.—963. TORRI, LUIGI, Bondeno (Ferrara).**

Hemp thread.

Small bundles.

Raw hemp.

The territory of Bondino is distinguished in Ferrarese for its hemp, the quality of which rivals that of the Bolognese.

**§ 3. ROPE MAKING.**

Rope-making has made but little progress even in the centre of Italy, where hemp is cultivated in great abundance. They still

use the old machines for twisting the strand, and the common sort of hemp is used.

In the province of Bologna they make 500,000 kilos of packing cloths, and 10,000 kilos. of rope, of the annual value of £21,400.

**1530.—1336. FERRARA, (ROYAL CHAMBER OF COMMERCE OF).**

Cables, marlines, common rope, hand made.

**1531.—1352\*. FERRIGNI, GIUSEPPE, *Leghorn*.**

Cables and other ropes.

**1532.—1338. MEZZANO, P., *Celle (Genoa)*.**

Fishing nets.

**1533.—1346. PERSICHETTI, SALVATORE, *Ancona*.**

Cables, marlines, ropes, twine, and sailcloth.

**1534.—1351. ZILIANI, GIOVANNI BATTISTA, *Brescia*.**

Nets for catching birds, &c.

§ 4. SPINNING.

**1535.—954. RIZZOLI, RAFFAELLO, *Bologna*.**

Samples of spun hemp.

M. Raffaello Rizzoli, the Count Zucchini, M. Minghetti, and M. Bignami, founded in 1851, at about 4 kilometres from Bologna, under the name of Rizzoli and Co., a large establishment for weaving hemp by machinery, set in motion by a hydraulic power of from 60 to 70 horses, and by a steam-engine of 75 horse-power, which works when there is no water to turn a turbine of 150 horses, which must be added to the other motive powers.

This establishment is founded upon a partnership capital of £40,000, in 200 shares of £20 each, the whole of which is paid up.

In 1860 it produced 45,000 kilos. of yarn in 287 days' work, with 2,684 spindles, which worked up 540,000 kilos of raw hemp.

The establishment is being enlarged, and is about to keep in work 4,000 spindles, and will consume annually 900,000 kilos. of raw hemp. The activity of this factory has been obtained notwithstanding the reduction of the duties levied upon foreign yarn, which duties have been reduced from £3 3s. to 8s. 4d., since the annexation of the other provinces of the kingdom of Italy.

From its importance and its management it is not inferior to the great manufactories established and so much admired in France and England. The following is the price of its productions:—

CURRENT PRICE PER KILO. OF RAW HEMP.

Brand.	1st quality.		2nd quality.	
	s.	d.	s.	d.
0	—	—	0	7
1	—	—	0	8½
4	—	—	0	10
6	—	—	1	0½
8	—	—	1	1½
10	1	6½	1	4
12	1	8	1	6
14	1	11	1	8
16	2	0½	1	10
18	2	2½	2	0
20	2	4	—	—
20	2	10	—	—
30	—	—	—	—
35	—	—	—	—

Warehousing and packing cost 8d. per package, paid by the buyer. A package is composed of 20 small bundles of 3,000 yards, equal to 2,742 metres.

§ 5. WEAVING.

The products of this group are not of great commercial importance, because there is no special manufacture established in the centre of the hemp cultivation.

In the Bolognese there are only about 400 hand looms. The work is performed at home, partly on account of the weavers, and partly on account of the merchants. They make cloths for domestic purposes, at an average length of about 2,500 metres, at a price of 58 to 90 centimes the metre; and sack and sail cloth at from 38 to 54 centimes the metre.

At Badi, a small village in the Apennines, near Porretta, the weaver's looms are made.

**1536.—1079. BOLGÈ, TERESA, *Brescia*.**

Cloths.

**1537.—1332. CAMPOBASSO**  
(SUB-COMMITTEE OF).

Common household cloths.

**1538.—1334. DE ANGELIS,**  
FERDINANDO & FILIPPO, *Naples.*Hempen cloth, called (*Olonà*), for  
sails.Hempen cloth, brown.  
do white.**1539.—1341. NOBERASCO,**  
LUIGI, *Savona.*

Sailcloth.

**1540.—1343. PADOA, P. Cento**  
(*Ferrara*).

Hempen cloth.

M. Padoa makes yearly 2,000 pieces of  
sailcloth, of 100,000 metres, and for sacks  
and packing 600,000 metres, divided into  
6,000 pieces.**1541.—1353.\* REGGIO (AGRI-**  
CULTURAL COMMISSION OF)

Common hempen cloth.

do. for sails.

Hemp in various states.

Hemp thread.

Winter flax.

The spinning is done by hand; the cloth  
is made by the common looms, at the houses  
of the peasants.The raw hemp comes from Bologna and  
Ferrara, except a small quantity from the  
province of Reggio.**1542.—1349. REGGIO (AGRICUL-**  
TURAL SOCIETY OF)

Spun hemp; price 2s. 5½d. per kil.

Spun flax; price 3s. 4d. per kil.

Common hempen cloth; price 1s. 5d.  
per square yard.Common sail cloth; price 1s. 5d.  
per square yard.Flax cloth; price 10½d. per square  
yard.**1543.—953. REVEDIN, Count,**  
GIOVANNI, *Ferrara.*

Samartina hemp.

Ropes and hanks.

Sail cloth, for sacks and bagging.

In the making of these cloths there are  
no looms collected together in one special  
factory; the weaving is done at home, by  
the common looms. The thread is made by  
hand, with great care.**§ 6. PRODUCTS AND SPECIAL APPLI-**  
CATIONS.**1544.—897. BOTTER, Prof. LUIGI,**  
*Bologna.*

Hemp seed oil.

Hemp seed cakes for manure, after  
the extraction of the oil.Very light charcoal, obtained from  
hemp stalks.**1545.—1329 bis. BISI,—, Bologna.**  
Hemp-stalk charcoal.Experiment on hemp, worked by  
Macadam's machine.Series of products of hemp stalks,  
previous to steeping.There is no particular trade in oil or hemp-  
seed cake, nor is there any special industry  
connected therewith. The amount of cake is  
very small compared with the quantities  
pressed.The charcoal of hemp is very much in re-  
quest for the manufacture of gunpowder and  
artificial fireworks. M. Bisi makes a large  
quantity, and the price, which is very high,  
is 1 franc and upwards, the kilogramme.Although the special products of hemp of  
M. Girolamo Botter, of Treviso, have not been  
exhibited in London, they are very important,  
especially a sort of cloth brush, employed in  
cleaning rice.

## SECTION III.

## FLAX.

## GENERAL OBSERVATIONS.

The culture of flax in Italy is much more ancient than that of hemp. It was extensive even in the times shortly before the Christian era, when hemp was but little known. It is now generally scattered over small districts, and this renders it very difficult to collect complete statistical data respecting it. Of the two products of flax, the stalk and the seed, we shall here only refer to the stalk. (As regards the seed and its uses see Class IV. § 5).

According to the "Italian Statistical Annual of 1857-8," the production of raw flax reached, in round numbers, 21 millions of kilogrammes.

	Kilogrammes.
The province of Brescia furnished...	1,000,000
The territory of Crema ...	360,000
The Valtellina ...	44,000
The province of Cremona (flax and a little hemp) ...	200,000
The Neapolitan provinces, and especially the districts of Potenza, Lagonero, Melfi, Matera ...	500,000
The province of Calabria, Ultra II. ...	200,000

In Piedmont flax is cultivated in many places, but it is not sufficient for the consumption, and the importation exceeded the exportation in 1857 by 891,589 kilos. Umbria, the Marches, and the Romagna furnish also several thousand kilos. of flax, especially Faenza, Viterbo, and the environs of Rome. At Sila (Cosenza) 400 hectares are devoted to the cultivation of flax. Unlike hemp, flax is deemed to be very impoverishing; and in every place where the two are cultivated together, the one reduces the other to nothing, as may be seen in the centres of the hemp production.

In Lombardy the autumn flax yields 800 kilos. of seed and 350 of stalk per hectare; and the spring flax 550 kilos. of seed and 400 of stalk. The quantity of seed sowed per hectare is from 150 to 200 kilos., and if the soil is good the produce will amount to 280 kilos., with 500 kilos. of stalk.

There are places in Italy where the flax is cultivated exclusively for the seed. As water is wanted for steeping, the stalk is sacrificed and burnt in the kilns. This is the practice in Apulia, Calabria, and Sicily (except in Catania).

The culture of flax is beneficial in new and well-watered lands; it is however very extensive in Lombardy and some parts of the south. The finest and most esteemed flax comes from Crema and Catauzaro.

The steeping is performed in marshes and in running waters, or in artificial pits. Mechanical contrivances have not yet been used so much for flax as for hemp, and Dickson's machines, introduced at Novara to extract the fibre without steeping, has not produced favourable results for a company established for that purpose. Quadri's establishment at Naples, already spoken of in connexion with the hemp manufacture, is not sufficiently supplied with the article to direct his attention to its treatment.

The production of flax, as well as the methods of cultivating it, differs greatly in different localities.

The manufacture of flax is carried on in labourers' houses, rather than in special establishments, except the three at Capaccio, Olmé, and Melagnano, in Lombardy, which, since 1855, has increased the number of spindles, so that computing the establishment of Capaccio at 6,000 and that of Olmé at 5,000, they produce together 350,000 kilogrammes of thread of the first quality and 720,000 of the second quality. There are also those of the Parthenopean Company, at Naples, with 6,000 spindles; that of Sarno, with 1,500; and that of Atripalide, with 1,800 spindles.

The establishment of Rizzoli and Co., of Bologna, spins hemp only; the house of Sarno uses the power-loom and weaves flax with both long and cut fibre; with the exception of the above houses, the old methods of spinning and weaving are generally followed, in Lombardy, notwithstanding its being a great flax district.

According to M. Zauardelli the manufacture of flax in Lombardy gives employment to 300,000 women, who at their own homes, with the distaff and spindle, earn scarcely 2d. per day.

From information respecting the province of Brescia, collected by the Royal Chamber of Commerce, it appears that at the commencement of the seventeenth century, the flax trade

was of great importance there; that they exported 1,500,000 kilos., whilst at the commencement of the present century there was scarcely an exportation of 400,000 kilos.

At the same period, at Salò there flourished a great trade in thread, and twenty-nine looms for thread twist yielded a value of £52,000. At the present time the trade is reduced to simple bleaching upon the pebbles of the Lake de Garda, where five or six persons bleach flax to the value of £2,400, in order that they may sell the bleached thread in the other Italian provinces. The weaving of flax is everywhere in a state of decay in those places, partly on account of the separation of Venetia from Lombardy, and the tariff which Austria has inflicted, but principally from the competition of cotton. The diminution has taken place especially in plain cloths and in damasks and dinnities.

A dinner service for twelve persons, including table-cloth and napkins, costs on an average 29s., and a service called "Flanders," for 24 persons, costs £5 8s.

In the province of Brescia there are 300 looms employed in flax weaving, which gives 10,000 pieces of 40 metres each, representing a value of £20,000. There are besides a dozen places where they make nets used in fishing and hunting.

In the same province of Crema the manufacture of flax is not in a state of progress; a fourth part of the produce is made by the looms of the country, but the bleaching is badly performed; and the manufacturers cannot compete successfully with Flanders and Ireland in their respective fabrics. In 1843 there were, according to Sanseverino, but two machines for agricultural purposes, and one only for the manufacture of thread.

In Sicily (Acireale, near Catania), they make very good linen fabrics, and very fine damasks of flax and cotton.

From these data it may be seen that the flax trade in Italy is by no means unimportant, and that it has slightly increased in recent years; but in yarns and cloths, although often very fine, they are unable to compete with those of Holland, Silesia, Rouen, Ireland, &c.

**1546.—973.\* BARACCO, BRO-  
THERS, Cotrone (Catanzaro).**

Livonian flax, cultivated at Sila.

**1547.—887. BARTOLINI, FRAN-  
CESCO, Carigliano (Cosenza).**

Spring broken flax.

M. Bartholmi has given a *Notice sur la culture du lin* at Cosenza. He says that it is cultivated most extensively in that province, especially in the territory of Sila.

Both winter and spring sorts are cultivated; the latter especially in open and light soils. It has alternate crops with artificial meadows and with corn. The fertility of the soil renders manure unnecessary. In the month of May they sow the seed by hand, and water it abundantly. When harvested and bound into sheaves and dried in the sun, they thresh the sheaves to get the seed. The flax is afterwards put into artificial pits to steep. It is beaten with rods and with the ordinary brake. The winter flax is sown in October and gathered in June.

**1548.—975\*. BERTONE DE  
SAMBUI, MARQUIS, Turin.**

Flax.

**1549.—1330. BORZONE, GIO-  
VANNI, Chiavari (Genoa).**

Cloth of inferior quality.

**1550.—899. 1331. CAGLIARI,  
(SUB-COMMITTEE OF).**

Flax of the province.

Hemp of the province.

Flax stalks.

Flax bath.

Hemp.

Flax cloth.

**1551.—980\* CASERTA, (SUB-  
COMMITTEE OF), Terra di Lavoro.**

Riga flax.

Caserta flax.

**1552.—1333. COSTA, GIULIA,  
Chiavari (Genoa).**

Linen cloths.

**1553.—2257. COSTANTINO,  
TOMMASO, Ascoli.**

Flax.

**1554.—1335. DEVOTO, A., Chia-  
vari (Genoa).**

Flax cloths.

**1555.**—985\*. FOGGIA, ROYAL ECONOMIC SOCIETY OF).

Thread of Riga flax, cultivated in the Agricultural Garden.  
Thread of flax cultivated in Calabria.

**1556.**—914. FRASSINETI, BROTHERS, *Castrocaro (Forli)*.

Flax in the sheaf.

**1557.** — 2259. GIORDANO, EUGENIO, *Salerno (Principato Citeriore)*.

Female flax.  
Dutch flax.  
Riga flax.  
Royal flax.  
Common flax.  
Flax seeds of all varieties.

**1558.**—920. GUIDO, BROTHERS, *Gargarengo (Novara)*.

Milanese flax.  
Winter flax.  
Native combed flax.

**1559.**—923, 1337. LUPINACCI, BARON LUIGI, AND BROTHERS, *Cosenza*.

Steeped and crushed flax.  
Flax, handspun, and woven in small looms, old system.

**1560.**—928. MAJORANA, BROTHERS, *Catania*.

Flax in various states.

**1561.**—1339. MILAN, (CHAMBER OF COMMERCE OF).

Collection of linen products manufactured in the province.

**1562.**—1340. MORELLI, GIOVANNI, *Rogliano (Cosenza)*.

Linen handspun napkins.  
Undressed linen cloths.

**1563.**—1344. NAPLES, (INDUSTRIAL PARTHENOPEAN SOCIETY OF).

Raw flax.  
Linen thread.  
Linen cloths.  
Raw hemp.

The establishment is situated at Sorno. It enjoys an exclusive privilege for making ropes by machinery, for combing by machinery, and for a peculiar method of making linen cloths.

**1564.**—1342. OSCULATI, PIROVANO AND CO., *Monza (Milan)*.

Trouserings, entirely of linen.

**1565.**—1347. POLENGHI, CARLO, *St. Fiorano, near Sodi*.

Plant, seed, thread, cloth, and napkins of linen.

**1566.**—1345. PELLEGRINETTI, FRANCESCO, *Florence*.

Linen damasked cloths.  
Towels, all linen.  
Do. damasked, all linen.  
Do. worked, all linen.  
Soft linen cloths.  
Do. do. varied.  
Damasked linen cloths.  
Damasked linen napkins.  
Smooth linen cloths.

**1567.**—2241.\* REGGIO (AGRICULTURAL COMMISSION OF).

Flax.

**1568.**—1344. SANGUINETTI, F., *Chiavari*.

Flax.

**1569.**—2252.\* TRUFFELI, DI TREVIGLIO.

Flax.

# CLASS XX.

## SILK AND VELVET.

### INTRODUCTORY REMARKS.

The total production of cocoons reaches, in ordinary years, to from fifty to sixty millions of kilos., which, at the price of ordinary crops, would be worth about £8,000,000 to £9,600,000; this would yield from four to five million kilogrammes of raw silk, of the value of £9,600,000 to £12,000,000; thus spread over the Italian provinces:—

Italian Tyrol	...	...	...	...	...	148,800	kils.
Venetia	...	...	...	...	...	703,360	"
Lombardy	...	...	...	...	...	1,408,320	"
Piedmont	...	...	...	...	...	916,667	"
Tuscany	...	...	...	...	...	140,671	"
Umbria	...	...	...	...	...	458,333	"
Southern provinces	...	...	...	...	...	422,016	"
Istria and Dalmatia	...	...	...	...	...	42,000	"
Total kils.						4,523,412	

Equal in value to £10,860,000.

About five-sixths of this quantity of raw silks is converted into organzine and tram, which increases its value by 6s. 8d. the kilo., thus giving a total produce of from £11,440,000 to £13,320,000. The factories in which this immense work is carried on are well adapted for it, both as to quality and quantity; and many amongst them, especially the principal ones, are fitted up in the most perfect manner, and conducted upon the most approved principles. The produce enjoys a reputation which renders it unnecessary to descant upon its merits.

A great number of the works are dispersed over different localities, adapted for the purpose either by the cheapness of labour, proximity to watercourses or waterfalls to set in motion the machinery, by facility in obtaining fuel, or the abundance of cocoons in the neighbourhood. The mills for making the organzine (*filatoj, orsoj*) are not so numerous as those for spinning.

The principal spinning mills work five or six months in the year, and those of lesser importance from four to six months only. The organzine mills are nearly always at work.

Some of the waste silk (*filaticcio casame*), whether arising in the manufacture or in connection with the cocoons, is utilised, by means of carding looms which have been recently erected. Silk dyeing, another trade recently very much improved, is carried on with great success in various parts of Italy. It is employed for the woven fabrics of the country, and dyes are prepared for exportation. For certain colours, the Italian black, for example, the establishments enjoy a reputation which secures them the custom of a large portion of the Prussian provinces, Switzerland, and Russia.

Sewing silk, called *cucirine*, is also a product of some of our manufactories, in Venetia, and particularly in the Veronese and the province of Vienza.

The art of silk weaving in common patterns is kept up to perfection; and patterns in various colours, from France especially, are closely imitated. At Milan they make articles in silk for religious purposes, in a very superior manner; and the manufacture of velvet, such as the articles exhibited by M. Ghighizzola, have reached the highest degree of perfection, especially by one of our manufacturers.

Raw and organzine silk constitute the most valuable material of Italian exportation, seven-eighths of the total production being sold to foreign countries. Some years ago, England and France took the largest portion of Italian silks; but recently Indian silks have

been preferred in the British markets, and even Italy, particularly Tuscany, has given the preference to them.

The exportation of silk may be considered at present as being three-fifths to the Prussian provinces, one-fifth to Switzerland, and one-fifth to England, France, and some other countries.

The greatest part of the inferior silk goes to England. The figured silks are sold in the country; the plain silks are sent in large quantities to the East, to the Danubian Principalities, Austria, and America. The silk trade, as well as others, must be estimated differently for various provinces.

#### LOMBARDY.

Lombardy produces, in ordinary times, from 15 to 18 million kilos. of cocoons, about one-fourth of the crop of Italy. She has about 3,088 looms, of which 144 use steam and 2,944 use fire; the first with 9,718 reels, the second with 29,486, in all 39,204, which employ 78,408 females, adults and children, on an average of 60 to 80 days in the year, or about 5,500,000 days' labour. The daily earnings of the women (*maestre*) is from 8d. to 10d., that of the helpers from 4½d. to 5½d., which gives for the season a total sum in wages of £153,625.

There are many mills and spindles for the making of organzines and trams in Lombardy, thus distributed:—

					Mills.	Spindles.
Province of Bergamo	...	...	...	...	110	333,000
Do. Como	...	...	...	...	210	162,000
Do. Milan	...	...	...	...	95	98,000
Do. Brescia	...	...	...	...	89	73,260
Other Lombard provinces	...	...	...	...	—	4,300

Four-fifths of these establishments have a water-power, some employ animals, and a small number use steam; they employ about 33,000 workpeople of both sexes, adults and children; the men earning 1s. 2d., the women 6½d., and the children 3d. per day.

The quantity of raw silk produced in Lombardy would only employ the mills during about eight months in the year; to provide work for the remainder, more than 160,000 kilos. of raw silk is brought in from other provinces.

The carding factories of waste silk (*fieuret*) are about ten, large and small, the whole established in the city or province of Milan. They employ 4,000 workpeople, men, women, and children, at wages of 1s. 3d. for the first, 8d. for the second, and 4d. for the children.

The whole of the carded silk is sent abroad. Dye works are only found at Milan and Como. The first of these cities has twelve, five of which are very large, and adopt all the improvements science and experience can suggest.

In their aggregate they employ about 240 persons, and annually dye more than 220,000 kilos. of silk. At Como, eight dyeing works give employment to nearly 90 workmen in dyeing 100,000 kilos. of silk. Black is the principal colour produced; and Milan black is that which forms the chief colour for exportation.

Silk spinning, properly speaking, is only carried on at Milan and Como and its environs. These two cities have 137 spinning mills, large and small, having about 6,500 looms, some common, and others Jacquard. Como alone has nearly 5,000, most of them common looms; more than half those at Milan are Jacquards. Besides this, Milan has eight ribbon manufactories, with 75 looms, 60 common and 15 Jacquards.

When the Lombard mills are all at work they employ 13,000 persons, of whom 11,500 are men and women, and 1,500 boys and girls. Their wages vary considerably, according to the skill of the workmen and the quality of the work; the most skilful workmen, employed on figured stuffs, earn from 14s. to 16s. per week; others from 8s. 6d. to 12s. 6d.; the women, who weave the less important work, receive 6s. to 8s. 6d. weekly; and the others from 5d. to 9d. daily.

The works at Como and Milan produce all kinds of silk tissues, plain and figured, for dresses, furniture, and tapestry. But at Milan, the largest quantity of figured silks are made, as also ribbons, and almost exclusively the stuffs of gold and silver for ornaments in churches and sacerdotal vestments. The works at Como also manufacture light and cheap plain silks, and find a market for them in Austria, in the East, and elsewhere.

The value of silk is increased to so great an extent when manufactured, that it may be estimated that the Lombard fabrics, including ribbons, produce, in years of ordinary working, an amount equal to £720,000.

#### PIEDMONT AND LIGURIA.

The ordinary silk crop from the cocoons is now estimated at eighteen millions of kilos. an increase of about one-third over what it was in 1840.

The reeling is performed by 1,000 spinning looms (*filande*), with about 30,000 basins. The apparent discrepancies in the different statistical accounts of silk spinning proceed from the fact that, in addition to the large establishments, there are lesser silk manufacturers, dispersed here and there, who have amongst them a large number of reels. A considerable number of the looms are moved by steam; and from official returns it is ascertained that at least 104 were at work during the last year. Piedmont carried away the prize of merit at the Exhibitions of London and Paris, for organzine. At the Exhibition of Paris, in 1855, the jury recognised the superiority of the sub-alpine provinces in the following words:—"The importance and the great progress made in spinning and weaving silks entitle them to a high rank in the principal markets of Europe." \* \* \* For these considerations the jury have awarded an honorary medal to the Chamber of Commerce of Turin, as the representative of the silk manufacturers of Piedmont."

Great improvements have been introduced into silk spinning, and the reeling is performed in the most perfect manner. The factory which formerly belonged to M. Rignon, in the district of Savigliano, is on a scale so extensive as to remind one of the great factories at Manchester. Those also of Moncardi, Brothers, at Racconigi, were greatly admired by the Duke of Brabant and Count Cavour.

The improvements made in the machinery, and the well-known patience and skill of the Piedmontese workmen, have prevented the silk trade from being fatally disturbed by the serious calamity which has happened to the production of silk. In fact, Piedmont placed itself in a position to work up the silks of India and China, so that in the disastrous years embraced between 1855 and 1860, according to the general report of the silk trade at Turin, it again rose to 400,000 kilos. of organzine and about 50,000 kilos. of tram. After some variations between high and low quantities, since 1846, the production at present has reached 575,000 kilos. in organzine and tram silk.

As regards the power-carding, called *Moresco*, next to De Filippi's establishment (near Arona, and that of Pignerol, is one set up at Perosa (Méina), by the Brothers Bolmier. - The dye works and the manufacture of silk stuffs, after having conferred on Italy the right to be proud of its superiority, have in Piedmont taken a fresh start in the career of progress.

The exportation of spun silk, dyed or simply cleaned, may be estimated at 50,000 kilos. yearly. That of fabrics of unmixed silk is on an average 50,000 kilos yearly; that of silk mixed with other materials is 7,000 kilos; in 1851, however, it exceeded 25,000 kilos. Such a trade must not be considered by quantity so much as by the perfection of its productions. The velvets of M. Guillot, the brocades, damasks, figured velvets for tapestry, and the furniture of M. Soles, have no need of encomium. The Italian Exhibition of 1861 rendered them ample justice.

We must not forget the magnificent ribbon manufacture by hydraulic power, with self-acting-ooms and the most approved machinery, founded at Turin by the Associated Manufacturers. It is provided with dye-works, as well as the necessary works for sizing, and is a model establishment.

A notice of the silk trade in general would be incomplete unless mention were made of Venetia, where the produce of cocoons is from nine to ten millions of kilogrammes, one-half of which proceeds from the Veronese. It is impossible to state, with any exactness, the actual number of looms, but it is certain that a large quantity of cocoons come from Lombardy and the Italian Tyrol. The waste from working raw silk into organzine and tram, feeds the carding establishments of Lombardy. It does not appear that Venice has any silk-dye works; it has, perhaps, some small manufactories of woven silk. The Vicentino and the Veronese produce a large quantity of sewing silk.

In the Italian Tyrol the silk trade is largely developed. At Trento, Borgo, Cavalese, Clés, Roveredo, &c., several looms are in a prosperous condition. They reckon in the aggregate 268 basins, and yield more than 100,000 kilogrammes of silk.

#### EMILIA, THE MARCHES, AND UMBRIA.

Emilia, the Marches, and Umbria, produce collectively from seven to eight millions of kilogrammes of cocoons. In almost all the centres of production looms are to be found. So much cannot be said of mills, as, for the most part, the raw silk is taken to Lombardy to be worked up, and a certain quantity of cocoons, especially from the provinces of Piacenza, Parma, and Modena, are also worked up at the looms in Lombardy. There is little or nothing done in the working up of waste silk of any kind. Weaving is carried on in some cities, as Bologna, Perugia, Camerino, and Piacenza, but particulars concerning the number and importance of their manufactures are wanting.

As regards Emilia, we may add, that in the ex-duchy of Parma and Piacenza, the making of lace and ribbons is carried on with success; and the tapestries of the Royal Palace, and the rich damasks of the church of San Giovanni, amply prove the skill of their manufacturers.

## TUSCANY.

The annual crop of cocoons in Tuscany is estimated at from three to four millions of kilogrammes. The factories there contain generally but very few basins (*bacinelle*), warmed either by warm water, in a bain marie, or by steam; the mills for making organzine are less numerous, and employed exclusively in working up silk for the home manufacture. There are also dye-works, which merely supply local wants.

At Florence, Lucca, Sienna, and elsewhere, there are silk mills for silk stuffs of different qualities, and also for light tissues, tulles, blondes, &c. At Florence there are nearly 3,300 looms, where they make the silks called Florence silks, and the *lustrini*, which enjoy such a high reputation, and which is an article of export to Germany, to the East, and to America. In the province of Lucca, silk weaving is gradually diminishing, not having more than about 200 looms.

## SOUTHERN PROVINCES.

The climate of the ex-kingdom of Naples is more favourable than any other for the cultivation of the mulberry-tree and the development of silkworms, and they are reared in almost all the provinces. The reeling has been greatly improved there, and the Neapolitan organzines begin to rival those of Piedmont, although a large portion of the Neapolitan silk feeds the mills of the other parts of Italy and of foreign countries.

The Southern provinces produce a large quantity of silk fabrics, of different qualities and good workmanship.

The silk-works of San Leucio and the Royal Lyceum *del Carminello*, those of M. Leonard Matera, of MM. Sibot and Ragliadori, as well as those of M. Martire, surpass all the others. They make Chini velvet, silk stuff for tapestry, the woof of which is made of coloured gold and silver glass thread, damasks, and beautiful figured and brocaded stuffs. The Neapolitan silk manufacturers pride themselves on the silks known as *Gros de Naples*, and the velvets of an even colour rival those of Lyons and Piedmont.

The provinces in which the manufacture of silk is in the greatest state of perfection are the Calabrias, the Terra di Lavoro, and several other districts of the province of Naples. Sicily has also considerable establishments at Palermo and especially at Catania and Acireale, having 170 jacquard looms, and more than 1,000 common looms for stuffs, and about 2,000 for ribbons.

The production suffices for home consumption and for a limited exportation to Malta.

The statistical accounts furnished for the whole of Italy are founded upon the production of the cocoons and upon the different silk trades in ordinary years.

The attacks of the silk-worm disease have occasioned many important changes during several years past. The effects of this scourge vary in a remarkable manner, according to the time of the attack, the intensity of the disease, and a number of other circumstances. As it relates to a state of things which will, it is hoped, cease before long, we ought not to take this exceptional state as a basis for a report upon the multifarious trades supported by the silk-worm, in a country where so many millions are produced.

Wherever the disease appeared recourse was had to seed from a distant place, taking as much care as possible that it should be brought from some part which had not been attacked by the disease. It results that in Italy, and in some provinces more than others, the cocoons produced of late years have been of all sorts, all shapes, and of every quality; and, in spite of the best directed efforts made with a view to obtain a satisfactory production, as well in point of quality as quantity, it must be admitted that the crop of silk since the commencement of the disease has been diminished to one-third or one-half of what it was in ordinary years.

Many looms, and especially the smaller, have remained idle, and the larger have been kept on short time. The manufacturers, especially in Upper Italy, have modified their machinery so as to increase their business by working the Chinese and Levantine silks.

The manufacturers of sewing-silk have not remained idle, but have directed their attention to working up Chinese and Levantine silks also.

Silk-weaving has suffered more than any other trade, as, in addition to the commercial crisis of 1857, and irrespective of the recent political situation of America, and other disturbing causes affecting the silk-trade, the home consumption of all descriptions of silk has greatly diminished latterly—a natural result of the enhanced price.

Nevertheless, the Italians have not despaired; on the contrary, they have given proof of great intelligence, zeal, and activity, in endeavouring to mitigate the effects of this calamity. They have not neglected the cultivation of their mulberry-trees, and they have instituted examinations and experiments; with a view to secure good cocoons in greater abundance than the normal production of recent years, as soon as the disease shall have diminished in virulence or disappeared altogether.

# RAW SILKS, ORGANZINES, TRAMS, AND FLOSS.

## LOMBARDY.

**1570.**—1374. BAROZZI, ANTONIETTA, *Milan*.

Carded silk waste.

**1571.**—1380. BERETTA, BROTHERS, *Parlenghe, Brescia*.

Collection of silks.

**1572.**—1381. BERIZZI, STEFANO, *Bergamo*.

Raw silk.

Spun silk.

Tram.

Annual productions:—Organzine, 10,000 kilos., Chinese and Japanese trams 20,000.

**1573.**—1382. BERTARELLI, CONSTANTINO, *Cremona*.

Raw silk.

**1574.**—1387. BOZZOTTI, CESARE AND Co., *Milan*.

Raw silk.

Organzines produced by raw silk.

Trams of Chinese silk with numbered twists.

Double raw silk.

Sewing silk.

Do. of raw Chinese silk.

Raw silk.

Raw sewing silk.

This house keeps up spinning mills at Cassina, Baraggia, province of Milan, with 72 basins.

At Gorgonzola .....	38
„ Marcallo .....	56
„ Pioltello .....	26

Total 92

The three first establishments use steam, the last fire. This house produces besides, annually, at

Treviglio .....	15,000 kilos. tram.
Corbetta .....	10,000 „
Pioltello .....	6,000 „
Vimercate .....	5,000 „
Milan .....	16,000 kilos sewing silk.

Most of these mills are moved by hydraulic power, or by animal labour. The Milan mill is worked by steam.

There are 1,000 work people, men, women, and children, employed in these various workshops.

**1575.**—1389. BRUNI, FRANCESCO, *Milan*.

Black metallic coloured organzine, weight for weight.

Do. with addition of 12 per cent.

Do. do. 20 „

Metallic black and blue tram, with addition of 12 per cent.

**1576.**—828. CHISOLI, ANTONIO, *Grignan (Bergamo)*.

Indian silkworm cocoons, crossed with Chinese.

Chinese silkworm cocoons, crossed with native.

Raw silk obtained from the cocoons.

**1577.**—1402. CONTI, F., *Milan*.  
Silk tram of various qualities.

Organzine of the Tsatlee silk of Japan.

Raw silks; numbers 10/12 and 13/15.

**1578.**—1403. CORNA, GIOVANNI, *Pisogno (Brescia)*.

Collection of silk.

**1579.**—1404. CORTI, BROTHERS, *Milan*.

Raw silk.

Worked silk.

Messrs. Corti have a silk spinning factory of 200 basins, warmed by steam, and a mill at Chambon, in Castano, province of Milan. They have also at Valmolina, province of Como, an establishment for the making of organzine, 7,850 basins. At Castano, province of Milan, 3,000 basins. 600 workpeople, men, women, and children, work in these mills. The best processes and the last improvements are adopted there.

**1580.**—1407. DE ANTONI, CESARE, *Milan*.

Carded waste silk.

**1581.**—1493.\* DE CIANI, DOMENICO, *Trent*.

Silk raw and tram.

**1582.**—1409. DE FILIPPI, MERZAGORA AND Co., *Arona*.

Produce of carding the silks called *moresche* and *struse*.

Floss-silk.

The carding of waste silk was founded in 1852, and produced 20,000 kilos. of thread of different numbers, with a machine of 28 horsepower and 200 workmen. The numbers are counted up to 1,000 metres per kilogramme.

**1583.**—1417. FERRARI, FRANCESCO, *Codogno (Milan)*.

Raw silk.

Tram.

Silk, number 9/11.

Annual produce of silk 1,600 kilos., from 20,000 kilos. of cocoons. Weavers employed, 150, at wages of 9d. Price of the silk, £2 16s. 6d. per kilo.

Steam-wove silk, number 18/22.

Annual produce 3,500 kilos. Weavers employed, 120, at wages of 5d. Price of the silk £3 per kilo.

**1584.**—1421. FRANCHI, BROTHERS, *Brescia*.

Raw silk, number 14/16.

Spun organzine, same number.

Common organzine, number 24/26.

Double spun silk.

**1585.**—1425. GAVAZZI, PIETRO, *Milan*.

Raw white silk.

Raw yellow silk.

Organzine.

Trams of Chinese silk.

Raw and wrought silk.

The house of Gavazzi employs in its mills 200 basins, at Bellano, province of Como;

56 at Valmadrera, province of Como; 86 at Cernusco, province of Milan, being a total of 342 basins, all warmed by steam, and well-fitted up. Organzine mills deliver annually at Bellano 10,000 kilos., chiefly of tram Chinese silk. At Cernusco 10,000, exclusively trams of Chinese silk. It has a steam engine. At Desio (Milan), 20,000 ditto. At Valmadrera 13,000 in organzines, finished on the most approved principle; making a total of 53,000 kilos. 2,000 hands men, women, and children are employed at these various workshops.

**1586.**—1425. GIAMBARINI, ANTONIO, *Bergamo*.

Two-threaded tram, with numbered turns, made with raw Chinese silk.

Organzines with the same tram.

Single-threaded tram, with numbered turns.

Raw Japanese silk.

Workmen, 250; produce, 50 kilos. of trams daily.

**1587.**—1399. GOMBONI, BROTHERS, *Linione (Brescia)*.

Raw white and yellow silk.

Silk.

**1588.**—1498\*. HUTH, PIETRO, *Como*.

Coloured silk.

**1589.**—1499\*. IMPERATORE, GIACOMO AND SON, *Intra (Novara)*.

Silk tram.

**1590.**—1431. LANZANI, LUIGI AND BROTHERS, *Milan*.

Coarse hand-spun silk.

Coarse machine-made silk.

**1591.**—1434. LAZZARONI, PIETRO, *Milan*.

Chinese raw silk.

Tram obtained from the same silk.

**1592.—1435. LÆVENSTEIN AND Co., Milan.**

Coloured sewing silk.  
Organzines.  
Trams.

**1593.—1439. MASSINA, LUIGI, Calvenzano (Bergamo).**

Raw silk.

Workmen employed, 69; wages from 10d. to 1s. 3d.

**1594.—1440. MAZZERI, PAOLO, Milan.**

Coloured organzines,  
Coloured trams.  
Coloured silks.

This house employs about 40 workmen. It has 24 coppers for dyeing, chiefly black, having a speciality for "gall black" and "Florence black." This house uses a machine for stretching the silk after dyeing, and another machine, called the "great devil," for rapidly drying it; also a mill for gall nuts and valonias; and a steam engine for the above mill, and for drawing water in winter from a well, which, being warmer than that from the stream, is better suited for dyeing purposes. These advantages are not possessed by other dyers in Milan.

The application of this method of dyeing for silks employed in the manufacturing of silk stuffs, trams, and organzines, for instance, gives the maker a profit of from 10 to 33 per cent. in increase of weight.

**1595.—1503 bis. NIGRA, GIUSEPPE, Sartirana (Pavia).**

White silk, spun by steam engine.  
Yellow silk.

**1596.—1449. PADOVANI, BROTHERS, Codogno (Lodi).**

Silk produced from the cocoons of unhealthy silkworms.

**1597.—1455. PIAZZONI, GIOVANNI BATTISTA, Bergamo.**

Raw and spun silk.

**1598.—1459. PORRO, PIETRO, Milan.**

Raw silk.  
Organzine.  
Tram.

Manufacture established in 1845; work-people employed, 450 to 500, at wages of from 6½d. to 9½d. Products in organzines, 10,000 kilos.; trams, 8,000 kilos. This house employs at Vill'Albese, province of Como, basins, 92; women cleaners, 36; at Cassano Albese, Como, 36; together, 164 basins; all warmed by steam; and having reels set in motion by a steam engine. This same house keeps at work at the organzine and finishing mills at—

	spindles.
San Martino, Como . . . .	7,680
Resichetto di Erba . . . .	4,800

The spinning mill of S. Martino works up finished organzines; that of Resichetto, trams, for the most part Chinese. Improved machines, with fixed number of revolutions.

Annual production:—

7,000	kilos.	raw silk.
10,000	do.	organzine.
6,000	do.	trams.
16,000	do.	worked silk.

Workpeople 450, men, women and children.

**1599.—1460. PREISWERK, GIOVANNI. Milan.**

Sample of organzine, first quality.  
Do. twist, second quality.  
Assortment of organzines.  
Organzine, with numbered twists.  
Wrought silks.

This establishment produces 12,000 kilos., in organzine and tram, from Chinese raw silk. It has a turbine wheel equal to 50 horse-power, on the English system. The machinery employed, particularly in the mills, is of the best description. 3,000 persons, men, women, and children, are employed.

**1600.—1504.\* RIZZI, BROTHERS, Pisogno (Brescia).**

Raw silk

**1601.—1463. RONCHETTI, BROTHERS, Milan.**

Raw silk.  
Organzine.

Tram.

Organzine of Chinese silk.

The spinning mill of Messrs. Ronchetti, Brothers, at Milan, produces silk worked with 150 basins, warmed by steam. Hydraulic power. Machine to produce the double cross. Warming stove for drying the silk at all seasons. At Cambiago, near Sala, province of Como, 60 steam basins; at Gabbiate, in the same province, 40 basins by open fire: total 250 basins.

These works have three mills, with 12,000 spindles, at Civati, province of Como, and 8,000 spindles at Como. Messrs. Ronchetti have also reels with 6000 spindles, as well as machines with fixed number of revolutions for the preparation of Chinese silk, &c.

800 persons, men, women, and children, employed at these works, produce annually 12,000 kilos. of raw silk, &c.; 24,000 kilos. of wrought silk, which is sub-divided into 16,000 kilos. of organzine and 8,000 kilos. of tram.

**1602.—1437. ROSSI, MAFFIO, BROTHERS, Sondrio.**

Raw yellow and white silk.

Double spun silk.

Raw yellow and white silk, number 18/20.

Do., No. 10/18.

Do., No. 14/16.

Double spun silk.

**1603.—1446. ROTA, ANTONIO, Chiari (Brescia).**

Silk.

**1604.—1470. SCOLA, GAETANO, Villa d'Adda (Bergamo).**

Raw silk.

**1605.—1475. SORLINI, ANDREA, Ospitallo (Brescia).**

Assortment of silk.

**1606.—1477. STEINER, GIOVANNI AND SONS, Bergamo.**

Tram in two-threaded Chinese silk. Organzines.

Tram in one and two threaded Japanese silk.

Raw silk.

White and yellow organzines obtained from these silks.

**1607.—1478. SURTERA SOPRANSI, MARIA, Codogno (Lodi).**

Raw silk.

Double silk.

Empty cocoons.

Very sound African seed.

**1608.—1479. TALLACCHINI, BROTHERS, Milan.**

Organzine.

Raw silk.

Warp in Chinese silk.

Silk, raw and worked.

This house has 152 basins at Casciago, province of Como, and 104 basins at Comerio, in the same province.

These two mills are worked by steam, with improved machinery. 194 spindles at Biumo, Como, for organzine, and 50 at Comerio. Chinese tram; machines with a fixed number of revolutions; hydraulic power; looms of wrought and cast-iron. Annual production:—5,250 kil. raw silk at Casciago; 4,750 kil. raw silk at Comerio; 26,000 kil. organzine at Biumo; and 9,000 kilos. Chinese tram at Comerio. Workpeople, men, women, and children, 1,525.

**1069.—1508.\* VERZA, BROTHERS, Milan.**

Silk raw and tram.

**1610.—1486. ZAMERA (HEIRS OF), Brescia.**

Raw silk.

**1611.—1511.\* ZANARDINI, PIETRO, Pisogno (Brescia).**

Raw silk.

**1612.—1488. ZUPPINGER, SILBER AND Co., Bergamo.**

1, 2, and 3 threaded tram, with numbered twist, produced from raw Japanese and Chinese silk  
Organizes ditto.

Yellow raw silk.

Three-threaded tram of raw silk.

1, 2, and 3 threaded trams, with 800 twists produced from Japan and China silk, some treated with 3 per cent. of soap and some without soap.

Yellow organzines with two threads.  
Grenadine organzines.

Workpeople employed in the daily manufacture of 160 kil. of Asiatic or Italian silk, 800; in reeling 2,500; in spinning 350.

#### PIEDMONT AND LIGURIA.

**1613.**—1368. ANDREIS, VITTORIO, *Turin*.

Extra spun organzine.

**1614.**—1371. ASSOM, BROTHERS, *Villa Stellone (Turin)*.

Cocoons.

Raw silk.

**1615.**—1373. BANCALARI, GIOVANNI, *Chiavari (Genoa)*.

Raw silk.

**1616.**—1388. BARACCO, MICHELE, AND SON, *Turin*.

Extra spun white organzine.

Do. yellow do.

Do. double extra spun.

Do. golden yellow for screens.

Raw silk.

**1617.**—1375. BAVASSANO, GIOVANNI BATTISTA, *Alessandria*.

Raw and white silk, partly worked by Wansey's method and partly by Chambon's.

White and yellow raw silk.

The white silk comes from foreign cocoons, inferior to those of the country. The common numbers are those of 8-9 to 34-36. The mill, set in motion by a steam engine, has 118 reels enclosed in compartments warmed with steam, to dry the silk rapidly. Workmen employed, 180, from June till Christmas. Produce, 4,000 kilos., from 30,000 kilos. of cocoons.

**1618.**—1478. BELLINO, BROTHERS, *Turin*.

Yellow raw silk, with cocoons similar to those which produced the silk.

White silk, ditto.

Mill with 48 basins. Horse power employed. Annual produce, 1,200 to 2,000 kilos. The hanks have not the double lateral band; this is effected by means of special mechanism.

**1619.**—1385. BOLMIDA, BROTHERS, *Turin*.

Organzine.

Raw silk.

Coarse silk of various qualities.

Mill of 150 basins; workmen, 300.

**1620.**—1391. CASISSA, FRANCESCO AND SON, *Novi (Alessandria)*.

White raw silk.

Mill with 150 basins, with a steam-engine of 12-horse power.

They work up silk annually from 65,000 to 80,000 kilos. of cocoons, and obtain 6,500 to 7,000 kilos. of raw silk from numbers D 8-9 and D 34-36. Wansey's method of reeling. Workpeople employed:—Men, 20; with wages from 1s. 3d. to 1s. 8d.; women, 200, at wages from 7d. to 10d. Price of silk in 1861—68s. to 72s. 6d. the kilo.

**1621.**—1393. CERIANA, BROTHERS AND Co., *Turin*.

Collection of raw silks.

do. organzines.

Workpeople employed in the spinning work and the mills, 1,500. Cocoons, 300,000 kil. Silk made into organzine, 60,000 kilos.

**1622.**—1398. COLÓMBO, FRANCESCO, *Ceva (Cuneo).*

Raw silk, steam spun.

**1623.**—1411. DEL PRINO, MICHELE, *Vesime (Alessandria).*

Summer and autumn silk.

Summer and autumn silk, spun by a system of spinning, *centrale ventilatrice*, which saves 5 per cent.

Mill of 100 basins, warmed by steam. Hydraulic power.

**1624.**—1413. DE NEGRI, GIOVANNI BATISTA, *Bovi (Alessandria).*

Wansey white and yellow silk.

Yellow organzine; many brands.

White and yellow carded silk.

Organzines do do.

Grenadine do do.

Raw silk, organzines.

This mill has been at work since the year 1847, with steam engine of 6 horse-power. Workmen employed 150, at wages of from 6d. to 2s.; 15 assistants, at wages 1s. to 2s. 6d. Working six months in the year, they work up silk from 40,000 to 500,000 kils. cocoons, of the value of £10,800 to £25,000; and obtain 2,700 to 4000 kils. of silk of different numbers, of the value of £12,400 to £13,600, and 20,000 kilos. of floss. They work up also cocoons from the Levant.

**1625.**—1419. FONTANA, BENEDETTO, *Turin.*

Yellow organzine.

**1626.**—1422. GADDUM, E. F., *Torre Pellice (Turin).*

Raw silk, Nos. 10/11; elasticity 21 per cent.

Do. do. 12/13; elasticity 21 per cent.

Organzine, do. 20/22; elasticity 21 per cent.

Do. do. 24/26; elasticity 20 per cent.

Raw silk of Nos. D 10/11, 12/13; elasticity 20 to 21 per cent.

Work throughout the year. Basins, 80 in number. Produce of raw silk, 8,000 kilos. from 90,000 kilos. of cocoons. Workpeople 100, at wages of from 10d. to 1s. 3d.

**1627.**—1430. KELLER, ALBERTO, *Turin.*

Several samples of raw silk.

Several samples of worked silk.

**1628.**—1502.\* MOSCHETTI, GIOVANNI ANGELO, *Cuneo.*

Yellow raw silk.

Organzine.

Workmen employed, 30. Raw silk used up, 40,000 to 50,000 kilos. Produce in organzine, 3,800 to 4,800 kilos. of superior numbers.

**1629.**—1446. NOVELLI, CARLO, *Savigliano.*

Organzine.

Manufacture established since 1766, altered in 1855. Workmen employed, 80, at wages from 1s. 3d. to 1s. 6d. per day.

**1630.**—1456. PICCALUGA, EMANUELE, *Gavi (Alessandria).*

White and yellow silk.

Raw silk.

**1631.**—1458. PIZZORNI, ANTONIO MARIA, *Rossiglione (Genoa).*

White and yellow organzine, of many numbers.

Silk of Nos. 6-7, 7-8, 11-12, 12-13, 25-27, 32-34, 13-14 organzines.

The establishment unites spinning and organzine mills; and employs 260 workmen, at 10d. per day.

**1632.**—1471. SEGRÉ, SANSONE, *Vercelli (Novara).*

Raw silk.

**1633.**—1474. SOLARI, MICHELE, *Chiavari (Genoa).*

Raw silk.

**1634.**—1485. VIOLA, GIOVANNI,  
*Savona (Genoa).*

Raw silk.

EMILIA.

**1635.**—1365. ABBATE, PIETRO,  
*Parma.*

Raw silk.

Steam engine, with 6 horse-power; 135 basins.

**1636.**—1495.\* DIENA, M. G., late  
GIACOBBE, *Modena.*

Raw silk.

**1637.**—1442. MODENA, ABRAMO,  
*Reggio (Emilia).*

Raw silk.

**1638.**—1448. PADOA, PELLEGRINO,  
*Cento (Ferrara).*

Spun silk, No. 9/10.

**1639.**—1453. PERIPETTI, CARLO,  
*Piacenza.*

Spun silk.

**1640.**—1454. PIATTI AND Co.,  
*Piacenza.*

Spun silk.

**1641.**—1462. RAVENNA (SUB-  
COMMITTEE OF).

Raw silk.

Spun silk.

**1642.**—1472. SENOCCHI, GIO-  
VAN BATTISTA, *Piacenza.*

Spun silk.

**1643.**—1473. SINIGAGLIA,  
SAMUELE, *Lugo (Ravenna).*

Raw silk.

**1644.**—1481. TODI VECCHI,  
*Reggio (Emilia).*

Raw silk of native cocoons.

Tram.

Samples of sewing silk.

Steam engine for warming, and for working the apparatus. Workmen employed 100, during four months of the year. Wages from 8d. to 1s. 3½d. Produce 3,250 kilos., from 41,120 kilos. of native cocoons.

Produce sold at Turin, Milan, Lyons. The sewing silk is sold in the country, at £1 7s. 6d. per pound.

**1645.**—1512\*. ZANNOLI, LUIGI,  
*Cesena (Forlì).*

Raw silk.

MARCHES, UMBRIA.

**1646.**—1370. ASCOLI, ABRAMO,  
*Terni (Perugia).*

Raw silk.

Silk of native cocoons.

**1647.**—1372. BALDINI, LUIGI,  
*Perugia.*

Raw silk.

**1648.**—1377. BELLINI, GIOVAC-  
CHINO, *Osimo (Ancona).*

Raw silk.

**1649.**—1379. BERETTA, C.  
DANIELE, *Ancona.*

Raw silk.

Flock of waste silk.

**1650.**—1390. CARRADORI, GIU-  
SEPPE, *Osimo (Ancona).*

Raw silk.

**1651.**—1401. CONTI, ALDEBRANDO  
AND Co., *Fossombrone (Pesaro).*

Samples of raw silk.

**1652.**—1405. COZZA, COUNT GIOVANNI, *Orvieto (Perugia)*.

Raw silk.

**1653.**—1415. DIOTAIUTI, GIUSEPPE, *Osimo (Ancona)*.

Raw silk.

**1654.**—1416. FARAGLIA, MARIO, *Terni (Perugia)*.

**1655.**—1426. GIARDINIERI, BROTHERS, *Osimo (Ancona)*.

Raw silk.

**1656.**—1496.\* GIOVANELLI, AMATO AND DOMENICO, *Pesaro*.

Raw silk.

**1657.**—1432. LARDINELLI, BENEDETTO, *Osimo (Ancona)*.

Raw silk.

Warming by steam; motion given by six horse-power engine; 100 basins. From June to October they spin 40,000 kilos. of cocoons, with a produce of 3,333 kilos. royal silk, Nos. 8-10, at 66s. the kilo.; 9 kilos. middling silk, 38s. the kilo. 153 kilos. doubloon silk, 20s. the kilo. 1,086 kilos. coarse, 6s. 8d. the kilo. 3,030 kilos. refuse of the basins, 10d. the kilo.

**1658.**—1436. MACERATA (SUB-COMMITTEE OF).

Raw silk.

**1659.**—1450. PALAZZESCHI, GIOSUE, *Città di Castello (Perugia)*.

Raw silk.

**1660.**—1465. ROSSINI, GIOVANNI, *Terni (Perugia)*.

Raw silk.

**1661.**—1468. SALARI, DOMENICO, *Fuligno*.

Raw silk of the brand 9/10.

**1662.**—1482. TOMMASONI, GIUSEPPE, *Tesi (Ancona)*.

Raw silk.

**1663.**—845. TONI, FRANCESCO, *Perugia*.

Samples of raw silk.

**1664.**—1507.\* VALAZZI, LUIGI, *Pesaro*.

Raw silk.

**1665.**—1509. VIALI and MAZZETTI, *Fano (Pesaro)*.

Raw silk.

#### TUSCANY.

**1666.**—1369. ARCANGIOLI AGOSTINO, *Pistoja*.

Raw silk.

**1667.**—1383.\* BEVILACQUA, MARIANO, *Lucca*.

Silk of yellow cocoons, No. 10 11  
Straw and crimson yellow brocades

**1668.**—1386. BOLOGNINI, RIMEDIOTTI, *Pistoja*.

Raw silk.

**1669.**—1392. CECCONI AND SANTINI, *Lucca*.

Coloured floss silk for embroidering.

**1670.**—1670. CIVININI, LODOVICO, *Pistoja*.

Hanks of raw silk.

- 1671.**—1406. CRESTINI, DOMENICO,  
*Asinalunga (Sienna).*  
Spun yellow and white silk.  
Organzine.
- 1672.**—1410. DE GORI, Count AU-  
GUSTO, *Sienna.*  
Raw silk.
- 1673.**—1418. FERRI, BROTHERS,  
*Grosseto.*  
Silk.
- 1674.**—1420. FOSSI AND BRUS-  
COLI, *Florence.*  
Raw silk, No. 10/12.
- 1675.**—1428. GRASSI, FRANCESCO,  
*Vicosaro (Florence).*  
Raw silk.
- 1676.**—1433. LAZZARI, ROSA,  
*Lucca.*  
Yellow silk gauze.
- 1677.**—1438. MAGNANI, ERNESTO,  
*Florence.*  
Raw silk, No. 9 to 11.
- 1678.**—1444. NEFETTI, ANGELO,  
*Santa Sofia (Florence).*  
Raw silk.  
Hanks of silk.
- 1679.**—1445. NIERI AND LENCI,  
*Lucca.*  
Yellow cocoon silk.  
White do.  
Floss silk.
- 1680.**—1452. PASTACALDI,  
FEDERIGO, *Pistoja.*  
Raw silk.
- 1681.**—1451. PASQUI, Cav. ZANOBI,  
*Florence.*  
Spun silk.
- 1682.**—1457. PIERI PECCI, Count  
GIOVANNI, *Sienna.*  
First quality silk.
- 1683.**—1469. SARI, BALDASSARE,  
*Lucca.*  
Raw white silk extracted from Chi-  
nese cocoons.
- 1684.**—1480. TESI, LEOPOLDO,  
*Pistoja.*  
Raw silk.  
Time of working lasts about four months.  
Workpeople employed, 4 men, at wages of  
1s. 3d., 50 women at 10d. Produce 750 kilos.  
from 1,209 kilos. of cocoons of different  
origins.
- 1685.**—1484. VANNUCCI, GIU-  
SEPPE, *Pistoja.*  
Raw silk spun in three threads.
- NAPLES.
- 1686.**—1366. ACQUAVIVA,  
CARLO, *Giulia (Teramo).*  
Raw silk.
- 1687.**—1400. CAMPAGNA, PAS-  
QUALE, *Cosenza.*  
Organzine.
- 1688.**—1490 *bis.* CASTELLANA,  
(COUNT OF) *Teramo.*  
Silks.
- 1689.**—1491\*. COPPOLO, AN-  
TONIO, *Reggio (Calabria).*  
Raw silk.

**1690.—1414. DEVINCENZI,**  
GIOVANNI, *Notaresco (Teramo).*

Raw silk.

**1691.—1427. GRANOZIO,** Do-  
MENICO, *Salerno.*

Raw silk, organzine.

Organzine of 8s. 4d. to 10s. Workmen, 50,  
during three months. Wages of women, 5d.  
to 10d.; men, 1s. 8d. to 3s. 4d. Exportation  
to France.

**1692.—1497. HALLAM,** TOMMASO,  
*Villa S. Giovanni (Calabria).*

Raw silk.

**1693.—1500\*. LOFARO,** ANTONIO,  
*Reggio (Calabria).*

Raw silk.

**1694.—1501. LOFARO,** GIUSEPPE,  
*Reggio (Calabria).*

Raw silk.

**1695.—1438 bis. MARINCOLA,**  
FILIPPO AND LUIGI, *Catanzaro.*

Hanks of organzine silk, white and  
black.

Yellow organzines with number D  
9/10.

Do. white, with number D 8/9;  
Price £1 to £1 6s.

Water-heated.

**1696.—1440 bis. MELISSARI,**  
FRANCESCO, *Reggio (Calabria).*

Raw silk.

**1697.—1441. MIRABELLI,** FRAN-  
CESCO, *Cosenza.*

Yellow silk.

**1698.—1503.\* NAPLES (SUB-COM-  
MITTEE OF).**

Spun coloured silk.

Raw silk of the province of Naples.

**1699.—1447. OTTAVIANI,** BRO-  
THERS, *Cosenza.*

Raw silk.

**1700.—1460 bis. PRIMICERIO,**  
LUIGI, *Catanzaro.*

Hanks of silk in various qualities.

Hanks of silk organized.

Organzines, No. D 9 to 10, at the  
price of 24s. to 29s. the kilo.

Common raw silk with imperfect  
cocoon, 16s. 8d. the kilo.

Raw silk 12s. 6d. the kilo.

Coarse silk.

Heating by steam.

**1701.—1467. RUBINACCI,** SAL-  
VATORE, *Naples.*

Raw silk.

Sewing silks.

**1702.—1505.\* SCIARRONI,** MARIA,  
*Reggio (Calabria).*

Raw silks.

#### SICILY.

**1703.—1423. GALATTI,** GIACOMO,  
*Messina.*

Raw silk, white and yellow.

Mill of 42 reels, worked by steam. Skilled  
workmen 42; pupils 8; superintendents 2;  
examiners 2; overlookers 2; cocoon selectors  
48 to 80, from January to August. Work  
continued throughout the year.

**1704.—1429. JAEGER,** GUGLIELMO,  
*Messina.*

Raw silk.

**1705.—1487. ZUPPI,** BROTHERS,  
*Cerisano (Cosenza).*

Silk.

#### SILK FABRICS.

**1706.—1489.\* BACCHINI ROSSI,**  
LUISA, *Perugia.*

Silk shawls hand-made, on an embroidery loom.

Silk shawls, one blue, the other red and white. Price £3 8s.

Worked on the common loom.

**1707.—1376. BELLETTI, GIROLAMO, Bologna.**

Raw and craped gauze.

Coarse and spun silk.

100 men employed at 1s. 8d. per day. Old system of working.

**1708.—1489. bis. BIANCHI, DANIELE, Catanzaro.**

Damasks.

Calamo.

Organzines, No. D 10/11. Price 20s. to 26s. the kilo.

Plain and damask silks.

At the establishment of M. Bianchi the works are fitted up for common thread, organzines, and looms for weaving. 130 workmen are employed.

**1709.—1384. BINDA, AMBROGIO, Milan.**

Waistcoat pieces.

**1710.—1394. CHABANON, A., Portici (Naples).**

Silk galloon.

**1711.—1396. COLLIER, DIONISIO, Portici (Naples).**

Silk ribbons.

**1712.—1395. CHIGHIZZOLA, GIACOMO, Turin.**

Various coloured silk velvet.

The manufacture of velvet by M. Chighizzola, which has been established for 28 years only, employed in 1842 five weaving looms; after the Exhibitions of Turin in 1844, and of London in 1851, the number of looms was increased to 200, with 300 to 400 workmen; and the works go on increasing in the number of machines and of workmen, at the same time that all new improvements are adopted.

The factories are at Turin and at Zuagli, in Liguria. The products are thus distinguished:—1. Very superior quality velvet; splendid, on account of its extreme softness, richness, close felting, non-liability to rumple, and the beauty of the colour, which combine to give it an altogether superior character. 2. Middling quality. 3. Common, or inferior quality. The nature of these productions requires a most careful selection of all the elements of their manufacture, as much in the materials as in the colour, and also in the implements and workmanship. None but the very best silks are used.

The making of velvet has been carried on by the Genoese for a very long period. From Genoa it spread to Spain, France, and to the other cities and provinces of Italy; but nowhere, not even in Genoa itself, can any equal those better qualities manufactured by M. Chighizzola, as has been admitted at all the Exhibitions.

**1713.—1490\* CAMPANI, ISIDORO AND FEDERIGO, Gaudino (Milan).**

Silk fabrics.

**1714.—1492\*. CRISTOFANI, PIETRO, Florence.**

Various coloured stuffs.

Glacé and watered stuffs.

**1715.—1408\*. DE FERRARI, BROTHERS, Genoa.**

Silk velvets of various qualities.

**1716.—1494\*. DE FERRARI, GAETANO, Genoa.**

Silk velvets.

**1717.—1412. DEMEO, FRANCESCO, Messina.**

Ribbons and other silk stuffs.

**1718.—1438 bis\* MANGANO, ANTONINO, Messina.**

Drawing-room silk cloth.

**1719.—1630. MARINO, PIETRO,**

Galloon for carriages.

**1720.—1443. MORESCO AND MOLINARI, Genoa.**

Various sorts of velvet.

**1721.—1461. RAMPOLDI, DANIELE, Como.**

A drawing woven in colours.

**1722.—1506\*. SOLEI, BERNARDO, Turin.**

Silk fabrics for rooms and furniture.

**1723.—1476. SPEDALIERE, P., Portici (Naples).**

Silk galloons.

**1724.—1583. VALVO, PASQUALE, Portici (Naples).**

Ribbons and silk stuffs.

**1725.—1510\*. VIGANOTTI, GAS-PARE, Milan.**

Silk galloons.

Forty workmen, among whom are several very skilful, are employed in this factory, at wages from 1s. 8d. to 2s. 6d. per day.

## CLASSES XXI., XXII., XXIII.

### WOOLLEN AND WORSTED,

INCLUDING MIXED FABRICS, CARPETS, WOVEN, SPUN, FELTED, OR LAID FABRICS, AS SPECIMENS OF PRINTING OR DYEING.

Italy produces about ten millions kilos. of raw wool, coming principally from the Neapolitan and Romish provinces, and consisting of fine wools (*merinos*), mixed wools (*métis*), common wool, called *nostras*, as well as those of Sardinia. There is short silk wool, *bistosa* wool, half-wool, summer wool, lambs' wool, skin wool, &c. The long silky wools, combing wools, produced chiefly in the Neapolitan provinces, are much in request in France and Germany, on account of their fineness and whiteness. These productions belong to Class IV., section 2, § 1.

To compensate for the large exportation from the country, wool is imported from the Cape of Good Hope, Australia, France, America, Russia, and Germany.

Under the name of *artificial wool*, there is the produce of cleaned rags, used at Biella since 1848, and at present advantageously adopted in Piedmont, in Lombardy, and in Southern Italy, in the manufacture of inferior cloths; the price of this wool is from 10d. to 2s. 6d. per kilo., much under the price of virgin wool, which reaches from 1s. 3d. to 12s. 6d. the killogramme.

The refuse of the spinning mills form also an artificial wool, which, however, is of little value in Italy, for want of the large mills for carding and spinning.

The looms for short, silky wools, used in making broadcloth, are not distinguished from the manufactories of other woollen goods, and there is no trade in woollen wefts and warps. On the contrary, the looms of carded wool or worsted are very remarkable establishments, a small number of which exist in Piedmont, in Lombardy, and in the South. At the Exhibition of Florence there were collections of spun wool, white or dyed, plain or mixed, in which

the regularity and fineness of the thread were remarkably good. The improvement made in spring wool, through the invention of new machines, ensures for this business a brilliant future. Our combing wool, soft and very white, enables manufacturers to give their fabrics those brilliant colours so much sought after in the trade.

The past history of the wool trade in Italy is one continued career of prosperity.

In the 13th century there were at Florence 200 cloth workers, which, with a population of 70,000 inhabitants, gave employment to 50,000 persons, who turned out from 70,000 to 80,000 pieces of cloth, of the value of 1,200,000 gold florins. The manufacturers of Brabant, France, England, and Flanders, sent to Florence not fewer than 10,000 pieces of unfinished cloths, of the value of 300,000 golden florins, that they might be, as it was said in a word of Greek origin, *Calimalati*; that is to say, finished off according to the rules of art which were called Calimala; the name of which one of the streets in that great commercial and industrious city retains to this day, thus transmitting to our times the memory of the pre-eminence of Italy in that branch of art during the middle ages.

In the 12th century, Milan had 60,000 workmen employed in the manufacture of wool; and a great number of clothworks existed at Pavia, Como, Monza, and in the province of Bergamo.

In Venice the art of dyeing made the greatest progress, and it was in that city that there appeared, in 1429, the first treatise on the "Dying of Wools," which it appears is now not to be met with; and the book *Dell' Arte di tingere la lana*, printed in 1611, is a very rare work.

Whatever may have been its early history, our wool trade has in the present day declined from its former importance, compared with the progress which the production of wool and wool manufactures have made in France, England, Belgium, and Germany. But, viewed relatively, it is nevertheless far from being of secondary importance, since it is not only equal to the greater part of the inland demand, but it employs profitably a large number of workmen and very considerable capital.

There are important manufactures of various kinds of wool, especially in Piedmont and in the Neapolitan provinces. Blankets for the use of the army are made in Lombardy. In Venetia, M. Rossi's factory is remarkable, and we shall have occasion to notice it especially; woollen cloth manufactures are not wanting at Prato, Casentino, Arezzo, in Tuscany, although their establishments are small, and their machinery is capable of improvement.

According to certain statistical data, the total production of woollen cloth manufacture may be estimated at 10 millions of metres, of the value of £2,400,000, about half of which, taking into account the partial exportation of raw wool, and the importation to which we have referred, may be considered as belonging to the manufacturing industry, representing the price of labour and the capital employed in production; and the other half belongs to agricultural industry, the rearing of flocks, &c.

All woollen cloths may be separated into two great divisions, the carded and the combed wool.

The manufacture of cloths from carded wool embraces all those descriptions used for clothing, trousers, coats, flannels, blankets, &c. This manufacture is more ancient and better developed in Italy than that of combed wool, which includes all worsted stuffs, muslins, merinos, cloths, plaids, tartans, &c.

The manufacture of mixed stuffs, wool and cotton, wool and silk, is not large; and carpet-making is not sufficiently extensive to supply the home demand. Nevertheless, we have carpet manufactures; formerly there was a manufacture of felted carpets; and there is one in Piedmont now, which enjoys a well-merited reputation. The importation of carpets in the ancient Sardinian States alone is equal to 60,000 kilos., of the value of £20,000.

The manufacture of shawls has not made more progress, and the Sardinian States alone import upwards of 50,000 kilos. a year of this class.

The Exhibition of Florence demonstrated the tendency and the character of the woollen manufacture in Italy. In the North, the fineness of the work is the chief consideration; and great expense is there incurred in order to get new styles, and they are well informed respecting the most recent changes in the trade. The manufacturers of the Centre are, with some exceptions, less enterprising. Those of the South have, by the variety and abundance of their productions, astonished competent judges; and the question is still undecided as to which, the North or the South of Italy, the palm shall be awarded in the great industrial rivalry of the woollen manufactures.

The state of Italy has not, up to the present time, favoured the establishment of great centres of industry calculated to attract a large number of customers, so as to give that impulse to the trade which is generally the result of, and is only to be secured by, large markets, and that frequency of reports which both regulate and animate productive energy. The woollen market is as yet without any order, thereby rendering itself weak and powerless, at least in those markets which are only accessible to the individual energy of the few manufacturers to whom we are indebted for all the improvements yet achieved.

In respect to the elements of production, we are entirely dependent upon foreigners for

everything that relates to the machinery requisite to make cloth and looms, although some of our mechanical engineers have endeavoured to raise us from this state of inferiority.

Water, when plentiful, can be substituted for coal as a moving power, and almost all the weaving factories have availed themselves of it; but we have still to struggle against our backward position in chemistry and mechanics; and with the want of education amongst the workmen, which is, however, becoming daily improved. The rate of interest for money, which when in England it is only 2 and 3 per cent., is by our banks 4 and 5 per cent., is another disadvantage with which we have to contend.

The manufacturers of woollen cloths were extensive exhibitors at the Florence Exhibition, but the majority abstained from competing at the Universal Exhibition, so that in regard to the number and importance of the manufacturers who exhibited and those who did not, it is about one to ten; and thus the markets of Turin, Genoa, Milan, and Naples were deprived of the advantages which the general competition of all nations confers.

The development of spinning and combing wool limits the business of knitted work. To the difficulties thereby occasioned must be added those inflicted upon many national trades by the lowering of duties upon the importation of foreign products. This is undoubtedly a tribute to the principles of free trade, and to the community of interests between nations; but nevertheless it operates, at least for a time, in a serious manner against an industrial state which is not well established, and which, to protect itself from the competition of foreigners, can only obtain relief by the overthrow of barriers raised between various parts of the Peninsula, and the extension of markets, which has been the happy and natural consequence of the establishment of the new kingdom.

We ought not to conclude without saying a word by way of eulogium to the Jury and to the Special Commissioner for this Class, M. Cav. G. Salla, who has been removed from us by death within these few days. The life of this gentleman was wholly devoted to the improvement of the national industry. In prosecuting it he augmented his already considerable wealth; but, still more, in trade he found agreeable occupation for the valuable qualities of both his mind and his heart. His manners were unexceptionably courteous; a lover of order and of intellectual labour, he has bequeathed to his relatives and friends the remembrance of his virtues, which can never be obliterated.

He urged in the councils of the nation the adoption of laws founded on the principles of political economy, which contributes so essentially to the development of national wealth. He published several memoirs upon practical questions; one, a work upon dying wool; and it will be remembered that he belonged to that family which, in 1816, introduced into Italy machines for the making of woollen cloths.

#### § 1. SPUN WOOL.

##### 1726.—1515. ANTONGINI, BROTHERS, *Milan*.

Spun wool, raw or coloured.

Messrs. Antongini manufacture woollen yarn for cloths and embroidery work from No. 12 to 60. A dyeing house is annexed to the works, where the wools called Zephri, and the Ternaux or Berlin wool are finally prepared. The mill, established at Aranco, Borgo Sesia, Piedmont, with an hydraulic motive power, employs 200 workmen, women, and children; it turns out 55,000 kilos. of goods, obtained from about 5,000 bales, from the East, from Hungary, and Transylvania, the greater part, however, coming from Tuscany, Naples, and Romagna.

##### 1727.—1546. CECCONI AND SANTINI, *Lucca*.

Embroidery wool in various colours.

##### 1728.—1549. WAISER, S., *Modena*.

Wool in various colours.

#### § 2. TISSUES, CARPETS, &c.

##### 1729.—1545. BOSIO, F., AND CO.,

(See No. 1460, p. 242.)

##### 1730.—1530\*. CALAMINI, MODIGLIANO, AND CO., *Pisa*.

Woollen shawl in various colours.

##### 1731.—1516. CAGLIARI (SUB-COMMITTEE OF).

Two coverlids in filosella wool.  
Woollen fabrics for bags.

**1732.**—1530 *bis.* CAMPANA, ISIDORO AND FEDERIGO, *Gaudino (Bergamo)*.

Two cotton coverlids.

Do. do. filosella.

**1733.**—1535. CAMBRA, CARLO, *Graglia (Novara)*.

Woollen white, red, and green carpets, worth £40.

Various coloured woollen carpet, worth £28.

Woollen rose carpet, worth £24.

Carpet with yellow ground, worth £16.

**1734.**—1517 & 1536. CASTELLI, CARLO, *Milan*.

Coloured woollen coverlid.

Carpet.

**1735.**—1539.\* CIANFERONI, ANGELO, *Florence*.

Oil cloth carpet.

(See the various Oil Cloths, Class XI.)

**1736.**—1531.\* COSTANTINO, GIUSEPPE, *San Marco di Cavoti, Benevento*.

Counterpane.

**1737.**—1532.\* CROCCO, CARLO AND LUIGI, *Genoa*.

Woollen fabrics.

**1738.**—1533.\* FLORENCE, PIA CASA DI LAVORO.

Bed coverlids.

Flannel.

**1739.**—Wanting.

**1740.**—Wanting.

**1741.**—1547. FOLETTI, WEISS, AND Co.

(See 1462, p. 242.)

**1742.**—1540.\* GALLI, GAETANO, *Milan*.

Oil cloth carpet.

The manufactory of M. Galli, residing at Silico, has increased largely at various epochs since 1842, 1848, and 1849. It numbers at present 800 workmen, at wages from 5d. to 1s. 8d.

**1743.**—1534.\* GIANNATTASIO, GIUSEPPE, *Salerno*.

Coverlids.

**1744.**—HENKEL, LUIGI, *Florence*.

Various waterproof cloths and stuffs.

**1745.**—1518. HOZ AND FONZOLI, *Terni (Perugia)*.

Woollen and cotton cloths.

**1746.**—1550.\* HUBER & KELLER, *Pisa*.

(See 1463, p. 242.)

**1747.**—1519. LUPINACCI, BARON LUIGI, *Cosenza*.

Woollen cloths. A sample of the common fabric, made of native wool, handspun, and woven with old-fashioned looms.

**1748.**—1537. MILAN (BLIND ASYLUM OF).

Carpets worked by the blind.

**1749.**—1520. MORELLI, FRANCESCO, *Florence*.

Woollen and cotton cloths.

**1750.**—1521. MORELLI, GIOVANNI, *Rogliano (Cosenza)*.

Wool knitted by hand.

- 1751.—1522. ORLANDO, GIOVAN DONATO, Pescolamazza (Benevento).**

Common cloth.

- 1752.—1523. OSCULATI, PIRO-VANO AND Co., Monza (Milan).**

Cotton and woollen trouserings.

Cotton, woollen, and silk trouserings.

- 1753.—1524. PIRAS, MARIA, Samassi (Cagliari).**

Linen wallet, in the Sardinian fashion.

- 1754.—1538. PIRAS, VINCENZO, Samassi (Cagliari).**

Carpets.

- 1755.—1525. ROSSI, FRANCESCO, Milan.**

Stuffs of many qualities.

The important manufactory of Schio, in the province of Vicenza, in Venetia, was established in 1815; its greatest development dates from 1842, and subsequently from the years 1848-1849. It has contended successfully against the heavy competition of the Austrian manufactures, and against the overwhelming duties on the importation of machinery. It had to form its workmen, build repairing shops, &c. It employs 800 workpeople, that is, 550 men, who receive average wages of from 1s. 3d. to 1s. 9d. per day; 180 women, who receive on an average of from 7d. to 1s. 3d. daily; 70 children, who receive on an average 5d. to 10d. All the workmen are Italians, belonging to the place.

The proprietor, M. Alessandro Rossi, who is at the head of the establishment, manages it upon the combined Belgian and English system. The machines are almost all those of Verciers; they are set in motion by a power of 150 horses, which is obtained from a steam-engine, a turbine, and a hydraulic wheel. There are 200 looms, and all the apparatus necessary for washing the wools, and for cleaning them from seed, spinning, twisting, carding, &c. There are modified Meunier looms, an apparatus for removing and for setting the warps; fulling works, with cylinders and press; longitudinal and transversal shears, &c.

There are secondary establishments contiguous to the mill. Dye works complete; a soap house, which produces 500 kilos. of soap per day, which has been spoken of in Class II., and a gasoneter to supply 300 metres of gas in 24 hours.

The wool used comes from all parts, from Italy, the Continent, the Colonies, America, &c. The annual consumption is about £80,000. To this amount must be added that of labour and of many raw materials, £30,000; and the value of the produce of the works will be £110,000.

The greater part of the produce sells in Italy, notwithstanding the heavy customs duties which the works at Schio are compelled to pay in taking advantage of their best natural markets. These are the Italian cities beyond the Po and the Mincio, where, by the duties they have to pay, they are placed on the same level as the manufacturers of Prussia, France, and England.

- 1756.—1548. SANTILLI, BENEDETTO, Isernia (Campobasso).**

New mode of dyeing, for applying two different colours at the same time to both sides of the cloth.

- 1757.—1526. SELLA, BROTHERS, Biella (Turin).**

Black and blue cloths.

Black and blue cashmeres.

Black and blue pilots.

Different coloured Peruvian cloths.

The introduction of machines dates in this manufacture from 1814. 400 workmen are there employed, at a salary of 1s. 2d., 1s. 3d., and 1s. 9d. per diem. The wool worked is 90 to 100 thousand kilos., which are worth £24,000 to £26,000. The production is raised to 5,000 to 5,500 pieces of cloth, worth from £40,000 to £48,000. Peruvians are made there, and velvet, pilot cloths, cashmeres, satin of various colours (scarlet, black, blue, ash colour, skyblue, &c.), and various fabrics. The prices vary from 6s. 4d. to 16s. 10d. the metre, without discount.

- 1758.—1527. SELLA, MAURIZIO, Biella (Turin).**

Seven sorts of black Peruvians.

Three sorts of black cashmeres.

Black cloth.

Blue cloth.

Grey cloth.

Coffee-coloured cloth, two sorts.

Three sorts of Bedouins.

Five sorts of bronze-coloured Bedouins.

Slate-coloured velvet, five sorts.

Swanskin, three pieces, of which one is green.

Flannels, two pieces.

Black satin, three pieces.

**1759.**—1528. S. P A N O, L U I G I,  
*Oristano (Cagliari).*

Native wool.

Do. merinos.

Wallets of native wool.

Large linen and cotton bed coverlids.

Large linen and silk bed coverlids.

A rich pillow.

**1760.**—1529. THOMAS, *Achille.*

Cloths in cotton and wool made by machine looms.

**1761.**—1549. WISSER, S.

(See p. 255.)

## CLASS XXIV.

### TAPESTRY, LACES, AND EMBROIDERY.

Embroidery is an art which requires so much taste and artistic skill that it could not fail to be, as it actually is, universally diffused in Italy. But as regards its purely industrial aspects, it is still suffering from the evil influences which have operated on it in past times.

The greater part of the lace is made in Liguria, of silk or linen thread, but it has not yet advanced beyond the stage of mere manual production applied to very common articles. Nevertheless, a remarkable exportation of these products has taken place, and, fashion having contributed its aid, the business is kept up, although it is far from constituting an important article of trade.

Embroidery, in white and colours, is executed with great perfection, but besides the household work of the embroideresses, who are often artists of considerable merit, and the work of schools and charitable institutions, it is only in Liguria that there is a somewhat important production of embroidery, and especially of embroidery on muslin and jaconet. Embroidery in gold is of great importance at Milan, where there are 12 workshops for gold ornaments, and 350 to 400 workmen employed, at wages of 10d. to 4s. 2d. daily, with a trade of £24,000 to £28,000 annually.

It is always necessary to distinguish the weaving of gold thread from embroidery properly so called.

- 1762.**—1555. BAFICO, ANGELO,  
*Chiavari (Genoa).*  
Different sorts of lace.
- 1763.**—1566. BASSETTI, AN-  
TONIETTA, *Sienna.*  
Sleeves bordered with lace.
- 1764.**—1569.\* BROGGI, ANGELO  
AND DOMENICO, *Cantù (Como).*  
Lace with gauze, mantles, and orna-  
ments.
- 1765.**—1568.\* BONINI, MARIANNA,  
*Lucca.*  
Embroidered collar in high relief.  
Do. in bas-relief.  
Do. pillow lace.  
Do. lace.
- 1766.**—1558. CALANDRA, CAM-  
MILLO, *Savigliano (Cuneo).*  
White carpet, embroidered with the  
needle.
- 1766.**—CREMONCINI, ARTEMISIA,  
*S. Vivaldo (Florence).*  
Assortment of silk lace.  
Lace coverlid in relief.
- 1768.**—1559. CUCCHIETTI,  
CASIMIRO, *Busca (Como).*  
Half-point lace embroidery.
- 1769.**—1560. FIESCHI (CONSER-  
VATORY), *Genoa.*  
Embroidered handkerchiefs.
- 1770.**—1561. FUMMO, MARIA,  
*Naples.*  
Embroidered handkerchiefs.
- 1771.**—1562. GARBESI, ERSILIA  
AND ANGELO, *Lucca.*  
Silk shawls embroidered in the old  
lace fashion.
- 1772.**—1570.\* GENOA (WORK-  
HOUSE OF)  
Cambric handkerchiefs embroidered.  
Embroidered shirt.  
Lace pocket handkerchief.
- 1773.**—1571.\* LANDUZZI, FRAN-  
CESCO, *Bologna.*  
Flax thread embroidery.
- 1774.**—1572.\* LEPORATTI,  
ELISA, *Pistoja.*  
Embroidered silk, representing a  
landscape.
- 1775.**—1564. MARTINI, ERSILIA,  
*Milan.*  
Gold embroidery, in relief, imitating  
sculpture.  
Gold embroidery imitating cut work.  
Do. for soldiers, eccle-  
siastics, &c.  
The establishment of Mrs. Martini is re-  
markable for its productions imitating sculp-  
ture, and the ingenious artifices used to obtain  
striking effects. It employs 100 hands; 20  
men, 65 women, 15 children; at a salary of  
5d. to 4s. 2d., and carries on a trade of nearly  
£8,000.
- 1776.**—1563. MARTINI, LUIGI,  
*Milan.*  
Embroidered court dress.  
Church ornaments.  
New description of gold embroidery.  
Silk stuffs embroidered in gold.  
The workshop of M. Martini, which has  
been in constant activity for 50 years, pro-  
duces embroideries in gold, silver, coloured  
silk, in *chiaro-scuro*, in flat point, and in re-  
lief of every sort of pattern, and also the new  
invention called *pastel*.

With the exception of gold and silver thread, which is obtained from France, every material used is produced in the establishment itself. M. Martini uses up every year articles in fine gold, 150 kilos.; gilt, 500 kilos.; different silk stuffs, 270 to 500, representing a sum of £8,000, doubled in value when made up.

**1777.—1565. NAPLES** (ROYAL CONSERVATORY OF CARMINELLO).

Embroidered handkerchiefs.

**1778.—1566. PARLANTI, ERSILIA,**  
*Florence.*

Embroidery in silk, white and black, on cloth.

**1779.—1574.\* PANIZZI, MARIA,**  
*Parma.*

Embroidered handkerchiefs.

**1780.—1573. MARINO, PIETRO,**  
*Turin.*

Embroidery.

**1781.—2294.\* PETTI, EMILIA,**  
*Campobasso.*

Woollen embroidery.

**1782.—2295. PETRUCCI, AGNESE,**  
*Lucca.*

Handkerchief embroidered and ornamented with designs.

**1783.—2296.\* SERVI, ELISA,**  
*Florence.*

Black Thibet scarf, embroidered in coloured silk.

Lace for bonnets, &c.

**1784.—TESSADA, FRANCESCO,**  
*Genoa.*

Cambric handkerchiefs.

Mantillas.

Half-shawl.

White guipure.

**1785.—2297.\* TECCHI, ANTONI-  
ETTA, Pisa.**

Invisible mending in all sorts of cloths.

**1786.—1567. TACCHINI, TERESA,**  
*Modena.*

Embroidery in chiaro-scuro.

White embroidery on cloth.

**1787.—2298.\* TRAFIERI, ADE-  
LAIDE, Lucca.**

Cambric handkerchiefs, embroidered in white.

## CLASS XXV.

## SKINS, FUR, LEATHER, AND HAIR.

Although among its natural productions Italy possesses many species of animals, wild and tame, whose skins are used in furriery, yet the trade in them is not sufficiently important to command the attention of commercial men.

Sheep, lambs, and tame rabbits, goats, and cats, furnish skins, which when tanned with the fur on, give some occupation to the furriers; and such animals as the Alpine chamois, the mufiones of Sardinia, bears (at present very rare), and fallow deer, which are kept in considerable numbers in some places, also supply furs which are used as ornaments for rooms. Foxes, martens, pine martens, ferrets, polecats, otters, and squirrels are in some request; but the hare, rabbit, and otter supply the largest quantity of furs in common use, and their furs are employed in the manufacture of hats.

The greater part of the furs employed in clothing are imported from abroad, and the furriers' art is almost entirely reduced to adapting the different imported skins to suit the fashion of the day, or for any other purpose.

We have spoken of horsehair, silks, *byssus*, &c., in Class IV.

**1788.**—1577. SEVERI, ANGELO,  
*Reggio (Emilia).*

Fox fur.

Polecat, marten, and pine marten fur.

M. Severi employs three women four months per annum in preparing 200 fox skins, 100 polecat skins, 100 marten, and 20 pine martin skins. Price of unprepared skins: 2s. 2d. for fox skins, 3s. 1d. for polecats, 9s. 8d. for martens, and 11s. for pine martens. After preparation, the prices rise to 3s. 8d., 4s. 8d., 13s., 15s.

**1789.**—1574.\* ORRU, SALVATORE  
AND GIUSEPPE, *Cagliari.*

Roebuck, stag, and *muffione* fur.

**1790.**—1580. PICCINI, ANDREA,  
*Florence.*

Various sorts of silk brushes.

**1791.**—1576. PILLONI, ANNETA,  
*Cagliari.*

Various sorts of Italian silks.

**1792.**—1575. PRATTICO, FEDE-  
RIGO, *Naples.*

Birds' skin cap.

Muff of Siberian fox skin.

**1793.**—1578. SPANO, LUIGI, *Oris-  
tano (Cagliari).*

Various sorts of skins.

**1794.**—1579.\* WISER, SERAFINO,  
*Modena.*

Skin dressed with the wool on.

**1795 to 1819.**—(Wanting.)

# CLASS XXVI.

## LEATHER, INCLUDING SADDLERY AND HARNESS.

### INTRODUCTORY REMARKS.

#### § 1. ON TANNING AND THE MATERIALS USED THEREIN.

Naples, Ferrara, Mantua, Florence, and Venice were formerly celebrated for their coloured, gilt, and morocco leather; and the two latter cities, together with Rome and Rimini, were much noted for gloves and coloured skins. Since those days this branch of industry has declined, but not to such an extent as those of wool and silk.

In subdividing the business connected with the preparation of the skins of animals, so far as we can judge, the production of tanning materials and raw and half-cured hides belongs to Sicily, Sardinia, the Tuscan Maremmas, Trentino, Umbria, the Marches, and the valleys of Susa, Pinerolo, and Aosta. The finishing preparations of ordinary, morocco, and glazed leather are executed at Turin, Naples, Florence, and Bologna. We may estimate the produce of this trade in Italy at 30 millions of kilos., having an approximate value of £5,400,000, and this without reckoning the value added by supplementary processes which the skins undergo during their preparation.

The following Table shows the distribution of the trade in the different provinces of Italy:—

LOCALITIES.	Tanneries.	Workmen.	Skins.	Kilogrammes of Leather.	Value.
Town of Turin... ..	30	675	241,000	778,000	140,000
Liguria, Savoy, Genoa, S. } Maurice... ..	70	650	236,000	740,000	132,000
Sardinia ... ..	200	1,666	1,000,000	3,222,000	580,000
Various localities in Piedmont..	65	320	313,000	1,011,000	188,000
Milan... ..	30	300	172,000	556,000	100,000
Brescia .. ..	23	230	138,000	444,000	80,000
Lodi ... ..	8	80	48,000	155,000	27,840
Cremona ... ..	3	30	18,000	58,000	10,440
Pavia... ..	6	60	36,000	116,000	20,880
Various localities in Lombardy.	30	300	180,000	580,000	104,320
Venice ... ..	11	100	62,000	200,000	36,000
Various localities in Venetia ...	69	690	414,000	1,333,000	2,399,640
Vicenza ... ..	20	200	120,000	386,000	69,560
Bassano ... ..	12	120	72,000	232,000	40,120
Roman States ... ..	200	1,600	960,000	3,091,000	554,800
Parma ... ..	14	140	84,000	271,000	48,680
Modena ... ..	14	140	84,000	271,000	48,680
Leghorn .. ..	12	120	72,000	232,000	40,120
Terra di Lavoro ... ..	7	5,929	42,000	135,000	24,360
Calabria ... ..	5	70	30,000	97,000	16,600
Various Neapolitan localities ...	8	50	48,000	155,000	27,840
Do. do. do. ... ..	300	80	900,000	2,898,000	521,640
Catania ... ..	15	1,500	90,000	290,000	52,160
Messina ... ..	1	150	60,000	193,000	33,160
Various other Italian localities.	547	100	3,969,000	12,547,000	2,262,840
GENERAL TOTAL ... ..	1,700	15,500	9,317,000	30,000,000	5,400,000

## § 2. SUBSTANCES USED IN TANNING.

## A. NATIVE PRODUCTS.

M. Arnaudon has collected (Class IV., No. 1053) the most important mineral, animal, and vegetable materials which are employed to enable the skins of different animals to resist putrefaction, and at the same time give them sufficient suppleness and elasticity.

The word Sumach (*somnaco*) is generally applied to various species of *Rhus*, more particularly to the *Rhus Coriaria*, the *Rhus thyphina* (Virginian sumac), *Rhus pentaphylla* (sumach from Tegera), *Rhus Cotinus* (fustic, Scotano), the leaves of which are mixed with those of the lentiscus, the myrtle, the myrtillia, the tamarisk, and the arbutus. The best sumach comes from Sicily, from which place it is one of the principal articles of exportation. Two houses, and two only, that of M. Florio and that of M. Vetrana, of Palermo, produce annually about 6 millions of kilogrammes, valued at about £4,000. M. Majorana, of Catania, and Burgarella, of Trapani, produce pretty much the same.

The annual importation of this article from Sicily to France, England, and all the Italian provinces, represents a value of about £40,000. It is also an article of commerce, in a small way, in Sardinia, but the produce is not so much esteemed.

Sumach is principally used in the tanning of goat and sheep skins intended to take darkish colours, as green or red; for lighter colours, sumach is used in combination with the bark of the holm oak.

Sumach is employed in fixing the colours of saddlery leather.

The leaves of the fustic tree are used like those of the common sumach, but only in the Marches and Umbria, where tanning is carried on in pits, the skins being afterwards sewn together to make leather bottles, tanned after the Danish method.

The leaves of the myrtle, particularly of the *Myrtus communis*, are employed in the preparation of hides, that is to say, they are steeped in the water which is used to impregnate the skins with tannin. This mode of tanning, called the Italian way, is very prevalent in Tuscany, and is used almost exclusively, in certain southern provinces, for tanning the skins of animals; in Sardinia, for sheep-skins, they use sumach mixed with myrtle.

The leaves of the lentisk tree (*Pistacia Lentiscus*) are employed for the same purposes as those of the above-mentioned myrtle, and are used in the Neapolitan provinces, Sardinia, and the Volterrano.

The leaves of the tamarisk tree are used by the Sicilian tanners.

The leaves of the arbutus (*Arbutus Unedo*), which are very plentiful in Tuscany, Naples, Sicily, and Sardinia, were much sought after about one or two centuries ago, as well as those of the *Arbutus Uva ursi*.

The leaves of the *Rhododendrum ferrugineum*, which are plentiful in the Alps, are used by some tanners, particularly at Bielle, where, under the name of *rate*, they are mixed with oak bark and the produce of the *Casalpinia coriaria*, or *dividivi*, which are imported from abroad.

Various species of oak furnish very valuable bark, amongst which the preference is given to the cork tree of Tuscany and Sardinia, in which a large trade is carried on with England. In the forests belonging to the state lands in Tuscany, 900 tons are annually collected, and from those belonging to M. Maffei, at Volterra, 930 tons of different barks.

The bark of the hard oak (*Quercus Robur*), those of the *Quercus sessiliflora*, and of the *Quercus pedunculata*, are used, especially in Southern Italy. In Turin those which come from Montferriat and from the Comba of Susa are much esteemed.

The *Quercus Cerris* is found abundantly in the central provinces of Italy; its bark is used in the tanneries of Mondovì, Cuneo, and Alessandria for thick leather.

The holm oak (*Quercus ilex*) produces a bark used in the preparation of calf and goat-skins, which are used for saddlery and shoemaking. Sardinia and Tuscany export it in large quantities.

The bark of the cork tree (*Quercus suber*), cork, is almost exclusively used in the manufacture of shoe leather.

The bark of the *Alnus glutinosa* and *Alnus cordifolia* is used in Piedmont and Sardinia, sometimes alone, but frequently mixed with others.

The bark of the chestnut tree (*Castanea vesca*), which is used in Piedmont, and especially at Biella, is very good for the preparation of skins, though it imparts to them a dark colour; but this is made available when they are to be dyed black.

The birch (*Betula alba*) grows abundantly in the Valtellina, in the valleys of Aosta and Susa, but it is only used to prepare ox and cow hides in the same manner as Russia leather.

The Norway spruce (a very excellent dye) gives to the sheep-skins of Savoy and the valley of Aosta, which are sold profitably under the name of Savoy sheep-skins, a fine light charmois colour, closely resembling hazel.

The bark of the larch (*Larix europæa*, Dec.), as well as that of the fir, is frequently used in the small tanneries of the Alps, beyond Susa, where the value of it is estimated at from 5s. 5d. to 5s. 10d. per 100 kilos., and with this they prepare sheepskins, which, however, are not highly thought of in the market of Turin; and before they are made into morocco, it is the custom to pass them through a bath containing oak-bark and sumach.

Gall-nuts are excrescences which are produced on the leaves, on the fruit, or on the wood of various plants, and especially on the leaves of the different species of oak. They are much used in Piedmont for the preparation of strong leather, but the hardness and greenish colour which they impart to it lowers their price at Turin. Quantities of gall-nuts are collected at Mondovì, at Cuneo, Borgo Manesco, Ascoli, in Piedmont, in the Marches, in the Tuscan Maremmas, Calabria, &c.

The valonias (*vallonea*, *gallonea*) are the cups of oak acorns (*Quercus stagnosa*) and *Quercus pubescens* of Hungary and Piedmont, of the common oak, and of the *Quercus Ægilops*. Those which have the finest scales, which almost entirely cover the acorn, are the most esteemed by our tanners, who call them "valoni sticks" (*vallonea camata*). Trieste and Leghorn are the most abundant markets for this produce, which is brought to Italy from the Levant, and particularly from Turkey, Greece, and the Ionian isles. Sicily also produces it, but in very limited quantity. In Lombardy and the Romagna, valonia is almost exclusively used by the tanners; they mix it in Piedmont with oak bark.

The *Scilla maritima*, which grows naturally on the shores of the Mediterranean, is a plant which the Algerian tanners have utilised.

M. Arnaudon has made some attempts to utilise the residue of the tanneries in paper making.

#### B. EXOTIC PRODUCTS

Some applications of the *diridiri*, or *dividivi*, fruit of the *Cesalpinia coriaria*, have been made in the Piedmontese tanyards, and especially at Biella, Borgomanero, and Turin.

Some attempts have been made in England on *Catechu*, extracted from the *Areca Catechu*, and the leaves of *Nauchea Gambir*. This substance is but little known, and is always charged with rather heavy duties. The custom-houses applying to it the tariff of pharmaceutical substances, it cannot be employed in the Italian tanyards and dyeworks until its price shall be much reduced.

The *Algarabilla* is the fruit of a leguminous plant of the genus *Mimosa*, which grows in abundance in Paraguay. Besides tannin and a yellow colouring matter, M. G. Arnaudon has extracted from it starch, which is converted into alcohol during the tanning process, and which can be also obtained by distilling the water that is left.

The Bablah, the fruit of the *Acacia Bablah*, which is used in Africa, is little known among our tanners.

The *Ou-poci-tse*, or Chinese gallnut, is an excrescence growing on the leaves of the *Distylium racemosum*, according to M. Decaisne. It comes from China and Japan; it is used for tanning and for dyeing black, and produces a peculiarly beautiful pearl grey colour.

### § 3. COLOURING MATTERS.

In the list of colouring matters, we include those which are used for dyeing, colouring, and graduating the shades of the tissues, either by a direct process, or by means of heat, light, or the use of acids. For staining skins mineral substances, such as Prussian blue, or sulphate of iron, or vegetable substances, such as the woods of Cuba, Pernambuco, Campeachy, indigo, the bark and roots of the barberry tree, the flowers of the safflower, and lastly animal substances, such as cochineal. Leather dyeing is not altogether dissimilar to silk dyeing, but it is the most difficult branch of the dyeing art, because the nature of the animal tissue must be taken into consideration. This becomes changed at 70 degrees of heat, and it therefore requires skill to adjust the properties of tanning and colouring matters, and the various effects of all those processes which have for their object to convert raw hides into tanned leather.

#### A. YELLOW COLOURING MATTERS.

The barberry (*Berberis vulgaris*) is a shrub which grows abundantly in the Piedmontese Alps; its bark and especially its roots impart to hides tanned with alum and sumac a rather durable tint of light yellow.

The wood and the roots of the fustic, or the sumach, yield a yellow or scarlet colour when they are mixed with cochineal, or even tawny colours when they are mixed with indigo, carmine, orchella, or Campeachy wood, &c.

The woad (*Reseda luteola*) is a little used for dyeing skins which have been steeped in sumach; it is more used for sheep skins. It grows in abundance on the hills of Monteferrato and the mountains of Ascoli; it was formerly cultivated at Cortona, in Tuscany. (See Class IV., § 3.)

The broom used by the dyers (*Genista tinctoria*) is applied to the same purposes as the woad. It is very abundant from the first zones of the Alps down to the South.

Saffron (*Crocus sativus*) is used in the dyeing of skins, but merely to give more brilliancy to the scarlet of the cochineal. The cultivation of saffron is very general in Italy; the most celebrated places are those of Castelnuovo, of Catania, in Sicily, Aquila in the Capitanata, St. Govino in Sardinia, Bibbiena, and Montalcino in Tuscany.

The seeds of Avignon (*Rhamnus cathartica*) are very plentiful in the Maremmas, and are used to dye the skins yellow, or green when they are mixed with indigo.

The fustic (*Maclura tinctoria*) is employed for similar purposes as those of the roots of the barberry tree, but it does not give so deep a colour. The best comes from Cuba.

The Quercitron, or bark of the *Quercus tinctoria*, might be used in the same manner as sumach. If this kind of oak were more cultivated, it would be very useful in the tanning business.

The green ebony from the Antilles (*Excoccaria glandulosa*) has been used with success in some of our dyeing works, but at present is not much known.

For a description of the sulphur yellow ebony of Guiana, or Taign of Paraguay, or Spé of Brazil and Uruguay, the Olombeire of the Indian colonies of Portugal, see the book presented in 1858 by M. Arnaudon to the Academy of Sciences at Paris.

Respecting the yellow bark of Australia, see a second work, published in June, 1857. If Australia sent us any great quantity our dyeworks would be able to employ it largely for the purpose of giving hides and stuffs a deep yellow colour, produced by an alkaloid similar to that of the barberry tree.

We may also mention various sorts of wood coming from Siam and Australia, and among them the *Ouan-disi* of China, *Gardenia* sp.

Pionic acid, which is made at Turin and Milan, by the action of nitric acid upon indigo and upon coal tar, is obtained by the distillation of the bitumen of coal (phenic acid).

## B, BLUE COLOURING MATTER.

Amongst the matters employed by dyers for producing a blue colour, there is Prussian blue, obtained by the reaction of a salt of iron with soda and prussiate of potash. The blue colour of the indigo is produced in a large tub, either by a cold process with woad, or by dissolving indigo in sulphuric acid. Azuline is not used because of its high price.

## C. RED COLOURING MATTERS.

Madder (*Rubia tinctorum*) has for a long time been used in the dyeing of skins. The best comes from the plains of Capaccio, the neighbourhood of Salerno, Naples, and the Tuscan Maremmas, where it has been cultivated for many centuries. At present, Brazil wood and cochineal are used for the same purposes.\*

The berries of the *Phytolacca decandra* are used in dyeing purple and violet the skins prepared with sumach, and the sheepskins of Florence. The preparation and the use of the orchella (*Rocella tinctoria* and *Rocella fusiformis*, *Varidoria orcina*, and *V. dealbata*. *Lecanora*, &c.), has been discontinued in Tuscany, where formerly it was much esteemed. That which is at present used is prepared at Lyons and Huddersfield; and the suggestions of Gioberti and Cantù have not yet succeeded in inducing our workmen to use the colouring lichens, which are plentiful in Sardinia and the Alps. The safflower (*Carthamus tinctorius*) is used for dyeing skins and giving to them a metallic lustre. Ascoli, in the Marches, and Castrocaro, in Tuscany, have some commerce in this article.

Sorgho (*Sorghum glyceichilum*) is also a colouring plant, the stem and the rind of which, being fermented, produce a crimson, yellow, and red dye. Under the name of "violet woods," M. Arnaudon has grouped a certain number of dyewoods, belonging to different species, but which all alike have the property of giving a colourless substance, susceptible of being converted into a crimson red colouring matter by the influence of acids, heat, and light; each of these agents will give wood, or its extract, or any textile fabric, passed through a decoction of the wood itself, different tints varying from purple to violet, and from green to brown.

Arnotto, *Bixa orellana*, in non-alkaline solution is used to give the leather particular tints.

\* Attempts have been made to rear cochineal in the kingdom of Sardinia, with not very satisfactory results; some small quantity is produced in Sicily.

Besides the *Tsai*, and the leaves of the *Chica* (*Dignonnia Chica*), with which the Indians of South America prepare the *curare*, we have also to mention a numerous series of dyeing substances—red, violet, and bordering upon violet, known in commerce under the improper names of *fuchsines*, *ni-azulines*, &c., produced by the action of bichlorate of tin and mercury, arsenic acid, and the peroxide of manganese upon aniline, extracted from the distillation of coal-tar. These colours are brilliant, but not durable; they resemble the yellow colour of barberry—in that they are more durable on tanned leather, the presence of the tannin, and the chemical substance of leather having some influence upon these phenomena.

#### § 4. LEATHER AND ARTICLES OF LEATHER.

As regards leather, tanning by steeping has been generally relinquished, but is still used for goats' and sheep's skin. The processes followed by tanners, and the substances which they make use of, vary very much in every province, and, indeed, in every place. It cannot be said that there exists an Italian method of tanning; that which bears that name in Tuscany, and which is confined to that province and to a few other localities, being itself doomed to disappear for economical reasons.

Italian, or rather Tuscan tanning, consists essentially in giving the skins a preparatory treatment (*addobbo*) by immersion in six or seven successive baths (*ripassature*) of a decoction of myrtle leaves, to which are added oak bark and valonia; the next thing done is the covering over (*rammorto*), which is effected by spreading the skins in a pit, with layers of a composition made of ground valonia, steeped in a decoction of myrtle. The tanning lasts from 300 days to a year, according to the thickness of the skin. The small streaks, more or less regular, which may be seen on the surface of the leather curried in Tuscany arise from the peculiar process applied to it, to give it a finish, by currying the skins with the *fiscia* or *l'orbello*.\*

Tanning with myrtle leaves, which is still of great use in the small tanneries dispersed over the Neapolitan provinces, is effected by stretching out the skins, covered with myrtle, in a pit filled with water, where they remain from 30 to 36 months; the leaves are changed every 30 or 40 days. In Sardinia many tanners make use of myrtle, lentiscus, and tamarisk. In Lombardy, and particularly at Pavia, Brescia, Trento, and Venetia they use almost exclusively valonia for tanning, even without mixing it with myrtle.

A method of tanning, called French tanning, has been for a long time carried on in Piedmont; it might indeed with propriety be called an Italian method. In the provinces of the centre and south of Italy, it is performed by spreading layers of yew bark and cork bark over the skins; whilst in Piedmont they more generally make use of oak bark, common oak bark, &c. In certain parts of the north of the peninsula, at Biella, Bra, and Mondorì, for instance, they make use of oak galls, but this method, less approved than that done with bark, is becoming more in disuse every day, and is already confined to certain localities. In some tanneries they use a mixture of oak bark, dividivi, and the leaves of the *Rhododendrum*.

The bark tanneries which enjoy the highest reputation in Italy, are those of Messina, in Sicily; of Castellamare of Naples; of Brescia, Milan, Leghorn, Santa Croce, in Tuscany; Turin and Pinerolo, in Piedmont.

#### LEATHER FOR SADDLERY AND HARNESS.

For this manufacture the skins coming from the slaughter-houses are almost exclusively used; they are treated with holm oak bark, cork bark, and the leaves of the sumach. The skins for saddlery are made chiefly at Fabriano, at Turin, and at Castellamare, and are exported to the various provinces of Italy, to the Levant, and Germany.

#### COW HIDES AND CALF SKINS CURRIED FOR BOOTS AND SHOES.

This manufacture, which has acquired such importance in Nantes, Bordeaux, Geneva, and Lausanne, has been now for some time imported into Italy. Turin, Naples, and Florence have made great progress in its prosecution.

#### § 5. VARNISHED SKINS AND MOROCCO LEATHER.

Italy imports from France, and still more from Germany, the greater part of the japanned leather which it makes up. For some years this manufacture has been introduced into Lom-

\* The *fiscia* is a glass implement, which resembles the bottom of a common bottle; it is furnished with a handle; to lift up the skin, it is held on one side, and a little elevated, but to smooth the skin it is held horizontally; the skin is next stretched with the *orbello*, and afterwards the last polish is given by the *fiscia*.

bardy, Naples, Florence, and especially at Turin. The art of dyeing tanned skins with bark and with oil, &c., flourished in the fifteenth century at Venice and at Florence. The ancient reputation for this business has now passed to Naples and Turin, where the manufacture of late years has largely increased.

The most part of the goat and sheep skins are tanned with sumach brought from Sicily. In the Romagna they use fustic, which they enclose in sewed skins, like a bag, according to the Danish method of tanning. This method is also practised in Sicily.

In Piedmont the skins which are to be dyed colours are prepared with sumach, and those which are to be dyed black with oak and fir bark. Sardinia, the valleys of Piedmont, the Brescianese, the Abruzzi, and the Calabrias furnish the greater portion of raw skins; the Marches and Umbria export their skins half raw. Turin imports a certain quantity with the outside skin on, and some in leather, from France, especially from Gap, Nice, and Marseilles.

## § 6. TANNED SKINS AND CHAMOIS LEATHER.

The manufacture of white sheep-skins for lining is confined to the localities in which they are consumed, or to those parts in which vegetable substances for tanning are not to be found. Savoy was a province which supplied a certain quantity for exportation. Naples furnished sheep-skins for gloves, and Milan, Bologna, and Turin were the chief centres of these manufactures. The greater part of the skins destined for glove leather, only partly made up, are exported to Paris and Grenoble, because if they were sent in a completely finished state they would be subject to very high duties on passing the frontier.

The manufacture of chamois leather, formerly so flourishing in Italy, has disappeared in a great degree from this part of the country, particularly from Piedmont, so that sheep-skins take the place of chamois leather for gloves; calf leather has been substituted for military buff leather and cloth in dress. At present the greater part of the sheep-skins made up chamois fashion come from England, and they are manufactured upon a small scale at Lango, in Piedmont, and Florence. Turin has two manufactories of curried skins in imitation of buff leather; there are others at Florence, Naples, and Leghorn.

### § 1. LEATHER, TANNED AND TAWED SKINS.

#### 1820.—1601\*. ARNAUDON, LUIGI, *Turin*.

This establishment, one of the oldest in Piedmont, has introduced the manufacture of hat-bands and that of bronzed leathers, and has improved the dyeing and dressing of skins. Forty workmen are there employed, who prepare annually 132,000 skins, tanned for the most part in the establishment.

#### 1821.—1602.\* AVELLINO, (SUB-COMMISSION OF).

Sheepskins, coloured and in grain.  
Parchments.

#### 1822.—1603. BALDINI, AGOSTINO, *Brescia*.

Various leathers.

This manufactory employs 25 hands, at 1s. 3d. per day.

#### 1823.—1585. BERSELLI, CIRO, *Reggio (Emilia)*,

Leather tanned with valonea and with bark, for sole-leather and saddlery.

Cowhide and calfskin, natural and varnished.

#### 1824.—1604\*. BOLLIGÈ, TERESA, *Brescia*.

Calf, goat, and sheep parchment, for drums.

#### 1825.—1586. BOSSI, ODOARDO, *Naples*.

Lambskins and kid for gloves.

#### 1825 bis.—1613.\* GAMBAZZI, PIETRO, *Brescia*.

Skins.

#### 1826.—1605. CAPON, GABRIELLO, *Venice*.

Leather for soles tanned with oak and pine bark.

Calf for upper leathers.

**1827.—1606.\* CAPRETTI, PIETRO,** *Brescia.*

Hides.

**1828.—1587. CARLETTI, L.,** *Chiavenna.*

Collection of skins.

**1829.—CATORESI, FELICE,** *Teramo.*

Leathers.

**1830.—1607.\* CERESOLE, BROTHERS,** *Turin.*

Thick sole leather tanned with oak bark.

Black polished leather, natural and coloured, for saddlery and harness. Pigskin for saddlery.

This particular business is for saddlery for exportation; the establishment employs 50 to 60 workmen, and delivers annually £24,600 of produce, obtained from 2,400 quintals of raw hides, for the most part native, with a consumption of 9,100 quintals of bark.

**1831.—1603.\* CIONE, LUIGI,** *Florence.*

Japanned black and coloured skins.

Although of recent origin, the establishment has already acquired a high reputation in Tuscany for the good quality of its japan.

**1832.—1588. CONSIGLI, G.,** *Leghorn.*

Ox skin in straps.

**1833.—1588. CONSIGLI, GIOVANNI,** *Leghorn.*

Leather for soles.

Cowskin and calfskin, natural and varnished, for upper leather.

**1834.—1590. DEL SERE, GIOVACCHINO,** *Florence.*

Black leather for saddlery.

Russia red leather

Plain and japanned calf for upper leathers.

This establishment has contributed not a little to the improvement in Tuscany of the general manufacture, particularly as regards waxed calfskins.

**1835.—1609.\* DE FABRITIIS, BROTHERS,** *Teramo.*

Leather.

**1836.—1589. DEIDDA, ANTONIO,** *Cagliari.*

Leather for soles.

**1837.—1591. DONATI, AMEDEO,** *Sienna.*

Cowskin and calfskin for shoes and boots.

**1838.—1610. DEROSA, PIETRO,** *Benevento.*

Leather for soles.

**1839.—1592. DURIO, BROTHERS,** *Turin.*

Leather dressed without lime, for sole leather and for saddlegirths.

This tannery, one of the most renowned in Piedmont, and even in Italy, especially for SWISS sole leather, employs at least 60 workmen, working up annually 2,100 quintals of raw and salt hides, 10,000 quintals of oak bark, and produces for commerce 1,700 quintals of leather.

**1840.—1611.\* FIORINI, GIOVANNI,** *Darfo (Brescia).*

Calfskin with the outside on, tanned with oak bark.

This establishment works up annually 5,200 oxskins and horseskins; 24 workmen are there employed, at wages of 10d. to 2s. 2d. daily.

- 1841.**—1612.\* **FORNARI, BROTHERS,** *Fabriano.*

Undyed leather for saddlery.  
Varnished leather for upper leather.  
Morocco leather.

- 1842.**—1614.\* **IMPACCIATORE, TOMMASO ANTONIO,** *Teramo.*

Leather.

- 1843.**—1615.\* **LANZA, CAMMILLO,** *Turin.*

Leather.  
Calfskin.  
Straps for machines.

- 1844.**—1594. **MANCINI, ANTONIO,** *Arezzo.*

Leather.

- 1845.**—1616. **MESSINA (SUB-COMMITTEE OF).**

Collection of skins and leather.

- 1846.**—1616*bis*. **MODENA (CURRYING COMPANY OF).**

Calfskin for boots.

- 1847.**—1595. **ORRU, SALVATORE,** *Cagliari.*

Leather tanned with bark, for soles.  
Black Japanned leather, for harness.  
Undyed leather, for harness and saddlery.  
Red Russia leather, cowskin.

- 1848.**—1619\*. **PRACCHI, ANGELO,** *Lucca.*

Japanned skins and leather.

- 1849.**—1617\*. **PIACENTINI, BECCHI, AND Co.,** *Pescia.*

Leather tanned with myrtle leaves and valonea.

- 1850.**—1597. **PELLERANO, GIOVAN BATTISTA,** *Naples.*

Kid for gloves.

- 1851.**—1598. **PIELLA, GIUSEPPE,** *Pavia.*

Leather for gloves, tanned with valonea.

- 1852.**—1596. **PARMA (SUB-COMMITTEE OF).**

Leathers.

- 1853.**—1618\*. **PONCI, SERAFINO,** *Florence.*

Parchment.

- 1854.**—1620. **ROMANO, FRANCESCO,** *Turin.*

Natural and waxed calfskins.

- 1855.**—1593. **SAMMY-BONNET, MAURIZIO,** *Castellamare (Naples).*

Native and foreign leathers for soles.  
Calf for upper leathers.

This manufacture is one of the most important in the Neapolitan provinces, employing 60 workmen.

- 1856.**—1599. **SANTONI, FRANCESCO,** *Calci (Pisa).*

Leather for soles.  
Leather for saddles.  
Calf and goat skins.

- 1857.**—1621.\* **SORBI, LUIGI,** *Leghorn.*

Leather for saddles.  
Waxed calf skins.  
Goat skins.

- 1858.**—1622. **STICHLING, A.,** *Leghorn.*

Leather for soles.

**1859.**—1600. TANNING AND Co.,  
*Modena.*

Various skins.

**1860.**—1623.\* VIGNOLI, *Forli.*

Sheepskin with the outside layer on,  
for morocco.

#### HARNESS AND LEATHER WORK.

**1861.**—1628.\* ASTORRI, MAS-  
SIMO, *Forli.*

Harness.

**1862.**—1625. BARBARO, LUIGI,  
*Naples.*

Bridles.

**1863.**—1614. *bis.* BERTI, PIETRO,  
*Milan.*

Harness.

**1864.**—1626. CORA, DOMENICO AND  
SON, *Turin.*

Harness, English saddle.  
*Bardellina*, portmanteau.

**1865.**—1629.\* DELPERO, GIO-  
VAN BATTISTA, *Brescia.*

Whip thongs.

**1866.**—1627.\* LICHTENBERGER,  
BROTHERS, *Turin.*

Pigskin English saddles.

This establishment, of old reputation, em-  
ploys from 24 to 30 workmen.

**1867.**—1630. MARINO, PIETRO,  
*Turin.*

(See p. 340.)

**1868.**—1635. MARZOCCHINI,  
CESARE, *Calci (Pisa).*

Cigar cases.

Lucifer boxes.

Huntsman's flasks.

**1869.**—1631\*. TALAMUCCI,  
SANTI, *Florence.*

Saddles.

Cigar cases.

Lucifer boxes.

Tobacco boxes.

## CLASS XXVII.

### ARTICLES OF CLOTHING.

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With the exception of the different articles made of wheat and rye straw, Leghorn hats for men and women, plaits and gimp, in which straw, horse-hair and silk are combined, there are not any articles peculiar to Italy amongst the productions considered in this class.

The making of articles from straw, of which we have already spoken at some length (see Class IV., § 7), springs from a very ancient Italian art, cultivated in Bologna and elsewhere, and which was, perhaps, already flourishing in Tuscany in the thirteenth and fourteenth centuries; but it is only since the eighteenth century, subsequently to 1718, that this art has been of much importance in this province. Its head quarters were at Signa, near Florence, where it was first introduced by Domenico Michelacci, of Bologna, and where it had succeeded so far that it contributed to the export trade no less than 700,000 crowns in the year 1757. After a short suspension, at the beginning of this century, the manufacture of straw bonnets of a fashionable kind became more active, and in 1818 the number of workmen employed in plaiting and sewing the hats was estimated at 18,000. Nevertheless, since 1826, the export of plain straw, the change of fashion, and other causes have occasioned a decay of this trade in Tuscany, from which, however, it slightly recovered, so that the export of plaits and hats amounted, during only five years (between 1851 and 1858), to £2,501,645, making an average of £500,000.

The manufacture of fancy plaits has only commenced since 1839, and that of many fancy articles, such as imitation Panama hats, even more recently.

In the environs of Florence they use only very fine straw for plaiting, but in Casentino, (Tuscany), and in the Bolognese, they work up the coarser straw; from the Bolognese they send it to Tuscany to be finished and partly disposed of in the country; these hats, during the five years from 1851 to 1855 amounted in value to £404,324.

As regards the quality of these productions there is nothing to be said, after the decisions of the jury of the International Exhibition of 1851, which, in speaking of the progress made in the manufacture of Tuscan hats, places it above all others in Italy, Switzerland, Belgium, Saxony, and France; and honoured with a prize medal the persons employed in this branch of industry. The manufacture of straw formerly occupied nearly 100,000 persons, men, women, and children, who almost invariably worked at home, especially in the districts of Signa, S. Piero a Ponti, Carmignano, Brozzi, Campi, near Florence, Prato, and Pistoja. This branch of industry having been much extended, is now established in Umbria (province of Fermo), where it gives employment to nearly 5,000 workmen, producing hats worth £1,051; at Vicenza, there is an increase in value of £42,000.

On a par with the straw manufacture we must place that of the shavings of the willow (*truciolo*), which has its principal seat in the neighbourhood of Modena, and of which Carpi is the chief depôt. It brings in a revenue of from sixteen to twenty thousand pounds in plaits, fine and coarse hats, which are very cheap, and have a very elegant appearance. The manufacture of silk, woollen, felt, and cloth hats is carried on to a great extent in Turin, Pavia, Brescia, Parma, Catania, Bologna; and felt is even exported from those places in some quantity. Amongst the various products we must mention that of M. Ponchielli, of Brescia, who thought it possible to make felt of the hair of animals, and the silk of the typha of the Marches. Glove manufactories are established at Milan, Turin, Florence, and Naples, and they compete advantageously with foreign importations as regards quality, though they are indebted for the raw materials to other places. From the southern provinces there were received in 1860, 55,571 dozens of gloves.

Nowhere has any great trade in the more extensive kinds of cloths, shoes, or textile fabrics been developed. Although Italian workmanship in the clothing of both men and women, and in head dresses, is much esteemed in the east and in America; and though the tailors, milliners, and shoemakers work very well so far as the home consumption is concerned.

We have noticed embroideries elsewhere, and we have only to say that efforts are being made to introduce lacemaking at Milan, Turin, Florence, Parma, and other places.

**1870.**—1660. ALEPPI, L., *Parma*.  
(See class XVIII., No. 1466).

**1871.**—1640. A Z Z I, BROTHERS,  
*Lucca*.

Felt and hareskin hats.

**1872.**—1642 *bis*. BALDI, GIUSEPPE,  
*Florence*.

Shoes and lasts.

Orthopædic shoes with mechanical adaptation.

**1873.**—1642 *ter*. BELISARIO,  
CLEMENTE, *Castel Basso*.

Leghorn straw hats.

**1874.**—1641. BELTRAMI, P.,  
*Milan*.

Bonnets.

(See Class XI., No. 1364.)

**1875.**—1676.\* BERTI, ADELE, *Florence*.

Gloves cleaned by a special process.

**1876.**—1661. BINDA, AMBROGIO,  
*Milan*.

Woollen cravats.

Silk cravats.

(See Class XI., No. 1365).

**1877.**—BINDA, GRUGNOLA, AND  
Co., *Milan*.

Horn combs.

Combs for fastening on caps and bonnets.

**1878.**—1642. BORELLO, PIETRO  
AND BROTHERS, *Turin*.

Rabbitskin, catskin, hareskin, and beaver hats in various colours, silver, chestnut, black, &c.

**1879.**—1662. BOSSI, ODOARDO,  
*Naples*.

Gloves.

**1880.**—1663. BRACHETTI, GIOVANNI, S. Giovanni (*Val d'Arno*).

Diagram for cutting different articles of clothing out of a single piece of cloth.

Reversible trousers.

Waistcoats of silk cloth, to appear under four different aspects.

**1881.**—1657. BRAZZINI, DAVID,  
*Florence*.

Various fabrics in straw, horsehair, silk, for hats, bonnets, &c.

**1882.**—1680. BRUNO, GIOVANNI,  
*Turin*.

Jack-boots. Price, £3 12s. 6d.

Hunting boots. „ £1 12s. 6d.

Patent leather boots. £1 12s. 6d.

Sandals. „ 13s. 0d.

**1883.**—1655. CALZAROSSA, MADDALENA, *Parma*.

Ladies' bonnets, of velvet and crape.

Ladies' head-dresses.

Caps.

**1884.**—1643. CAMPOBASSO  
(SUB-COMMITTEE OF).

Woollen caps for peasants.

**1885.**—827. CARRO, MARIANNA,  
OF THE MONASTERY OF SANTA  
LUCIA, *Cagliari*.

Bouquet of flowers in shells.

(See Class IV., No. 1196.)

**1886.**—1644. CAVIGLIONE,  
RAIMONDO, *Turin*.

- |               |       |   |         |            |
|---------------|-------|---|---------|------------|
| Felt hat.     | Price | - | 11s.    | 8d.        |
| Common hat.   | "     |   | 10s.    | 0d.        |
| Do.           | "     |   | 8s.     | 4d.        |
| Hat on cloth. | "     |   | 10s.    | 10d.       |
| Common hat.   | "     |   | 6s.     | 3d.        |
| Gibus.        | "     |   | 7s. 6d. | to 6s. 3d. |
- 1887.**—1677. CERNUSCHI, BROTHERS, *Milan*.  
 Woollen, silk, gold and silver gimp.  
 Silk, woollen, cotton, spun silk,  
 gold and silver cords.  
 Wood buttons, covered with silk.  
 Laces of all kinds.  
 The business of M. Cernuschi, which has been actively carried on since 1830, employs 50 workmen, and produces very fine articles, but the want of woollen and cotton spun materials for his peculiar manufacture, places him at a great disadvantage in competing with foreign productions.
- 1888.**—1656. CLEMENTE, B., *Teramo*.  
 Straw bonnets.
- 1889.**—1658.\* CONTI, CESARE, *Florence*.  
 Collection of straw plaits.  
 Straw caps.  
 Cigar cases.
- 1890.**—1644. DE ANGELIS, A., *Messina*.  
 Artificial flowers.
- 1891.**—1678. DE BENEDETTI, BROTHERS, *Asti*.  
 White linen shirts with coloured collars, fronts, and wristbands; price 1s. 8d. each.
- 1892.**—1681. DELIA, PAOLO, *Leghorn*.  
 Various kinds of shoes.
- 1893.**—1665. DE MARTINO, GENNARO, *Naples*.  
 Lace parasols, old point, with coral handle, £12.  
 Various parasols, £3 to £1 12s. 6d.  
 Umbrellas, £1 8s. to £2.
- 1894.**—1666. DESSI MAGNETTI, A. V., *Cagliari*.  
 (See No. 1195.)
- 1895.**—1645. FOSSATI, ANTON MARIE, *Monza*.  
 Wool hats.  
 Goatskin hats.  
 Hareskin hats.
- 1896.**—1682. GALLI, NICCOLÒ, *Pisa*.  
 Strong boots, to wear in marshes.  
 Cavalry boots.
- 1897.**—1646. GALISE, VINCENZO, *Naples*.  
 Silk hats.
- 1898.**—1667. GILARDINI, GIOVANNI, *Turin*.  
 Various umbrellas.  
 The manufactory established at Biella employs constantly 95 workmen, whose number can be increased when necessary, at wages from 3s. 9d. to 2s. 1d.
- 1899.**—858.\* GIOVANNETTI, BROTHERS, *Pisa*.  
 Bone buttons for clothes.  
 Buttons, mounted with steel, for carriage cushions.  
 (See Class IV., No. 1197.)
- 1900.**—1686.\* GNESI, GAETANO, *Florence*.  
 Men and women's shoes and boots of various kinds, in different sorts of leather, cloth, &c.

- 1901.**—1685.\* FLORENCE WORKHOUSE, (*Pia Casa di Lavoro.*)  
Men's and women's shoes.
- 1902.**—1659.\* KUBLI, T. T., *Florence.*  
Collection of straw plaits.  
Straw bonnets.  
Straw cigar cases.
- 1903.**—1650.\* LA FARINA, CESARE, *Palermo.*  
Silk hats.
- 1904.**—1651. MANTELLERO, STEFANO AND BROTHERS, *Biella.*  
Hats of otter skin, hare skin, rabbit skin, wool, &c.
- 1905.**—2314.\* MASINI, AGOSTINO, *Florence.*  
Collection of straw plaits.  
Straw bonnets.
- 1906.**—1668. MESSINA (SUB-COMMITTEE OF)  
Gloves.
- 1907.**—1669. MONTECCHI, EGISTO AUGUSTO, *Parma.*  
Artificial flowers.  
Fruits.
- 1908.**—1687.\* PASQUERO, GIOVAN DOMENICO, *Turin.*  
Various shoes sewn on a new system, contrived to save labour; the seams are less conspicuous and more solid than usual.
- 1909.**—1670. PELLERANO, GIOVAN BATTISTA, *Naples.*  
Gloves.
- 1910.**—1652. PEONE, GILBERTO AND GHERARDO, *Leghorn.*  
Felt hats.
- 1911.**—1683.\* PERRATA, STEFANO, *Savona.*  
Various shoes and boots.
- 1912.**—1653. PIEROTTI, ULISSE AND AURELIO, *Florence.*  
Felt hats.
- 1913.**—1647. PANZONE, ANTONIO, *Milan.*  
Men's hats.  
Folding hats.  
Uniform hats.
- 1914.**—1671. PRATTICO, FEDERIGO, *Naples.*  
Gloves.
- 1915.**—1648. PUGLIESE, ANTONIO, *Cagliari.*  
Wool caps.
- 1916.**—1672. RANDACCIU, MARIANNA, *Cagliari.*  
Shawls woven from *Pinna* byssus.
- 1917.**—1649. RAVENNA (SUB-COMMITTEE OF).  
Felt hats of Lugo.
- 1918.**—1684. ROLANDO, ALESSIO, *Turin.*  
Various shoes.  
Workmen employed, 60 to 70; at wages of 5s. to 10s.
- 1919.**—1673. SALA, FRANCESCO, *Milan.*  
Gloves of various skins.

**1920.**—1688.\* SALANI, ANGELO,  
*Leghorn.*  
Shoes.

**1921.**—1674. TACCINI, LER-  
TORA AND Co., *Milan.*

Stuff buttons, machine made.  
Mother-of-pearl buttons.  
Metal buttons.  
Horn buttons.  
Silk mittens.  
Cravats.  
Scarfs.  
Laces.  
Samples of stuffs for making buttons.

**1922.**—1675. TESSADA, G., *Genoa.*  
Bonnets, burnous, cotton mantles.

**1923.**—1679.\* FESTA, GIOVANNI,  
*Turin.*  
Stays.

**1924.**—2315.\* NANNUCCI, AGNESE,  
*Florence.*

Hats (cappotte) in Florence straw,  
for men and women.  
Different articles in straw plait.  
Plaiting.

**1925.**—2316.\* V Y S E AND SON,  
*Prato.*

Straw hats.  
Straw plaiting.

The manufacture was founded in 1826. It employs nearly 280 workmen, at wages from 1s. 2d.; irrespective of those employed in the shops, employment is given to a number of workmen, which the exhibitor estimates at not less than 14,000 to 16,000.

Many different kinds of plaiting may be pointed out: point (*trece di punta*) of from 7 to 16 threads; plain plaits, or worked (*trece operate, trece di pedale*); white or coloured in maroon, black, or brown; mats with edgings are made (*Tortiglioni con nappe*), galoons, lace, &c.

The plaiting differs chiefly in the degree of fineness, expressed in numbers which reach from 35 to 112 and above.

The various men's, women's, and children's hats, and the capotes, are well worthy notice. (See also Class IV., and 1133, 1138, 1149, 1150.)

## CLASS XXVIII.

### PAPER, STATIONERY, PRINTING AND BOOK- BINDING.

Both Italy and Spain compete for the honour of having first manufactured paper from rags. It is certain that at Fabriano, in Umbria, and at Colle, in Tuscany, manufactures of this kind have existed ever since the fifteenth century. They spread over Italy, particularly on the borders of Lake de Garda, and in the succeeding century in Liguria. But this branch of industry, which formerly gave rise to a considerable trade, is not now so important; and although on the one hand paper making has progressed in quantity as well as quality, it cannot compete with the productions of the same kind from other countries, where the greater abundance of capital has furnished the means of manufacturing paper on a large scale, and especially of introducing machinery.

In Italy only part of the rags collected are used for this purpose, while several millions of kilos. of the raw material are annually shipped from Genoa, Leghorn, and Ancona, to the United States of America and England, on account of the low duty (1s. 8d. per cwt.), which scarcely interferes with their exportation, whilst in France these duties give a bounty to the paper trade.

In the following table will be found data, collected from different investigations which have been lately made. Of course, the amounts can only be approximative.

**NUMBER OF PAPER MILLS IN THE ITALIAN KINGDOM, AND AMOUNT OF THEIR ANNUAL PRODUCE.**

Provinces.	Mills.	Produce.	Vats.	Produce.	Total.
		Kil.		Kil.	Kil.
Piedmont.....	16	3,200,000	35	525,000	3,725,000
Liguria.....	4	700,000	74	1,100,000	1,800,000
Lombardy.....	8	1,500,000	200	3,000,000	4,500,000
Parma and Modena.....	1	100,000	40	600,000	700,000
Legations and Marches.....	"	"	40	600,000	600,000
Tuscany.....	3	500,000	120	1,800,000	2,300,000
Naples.....	20	4,000,000	137	2,055,000	6,055,000
Total.....	52	10,000,000	646	9,680,000	19,680,000

We must add the fabrics of Venetia, of the Italian Tyrol, and the patrimony of St. Peter, which collectively does not produce less than 3,000,000 kilos. annually, so that, with these, the total annual produce of paper in Italy may be supposed to be about 23,000,000 kilos. The largest part of the paper manufactured is consumed in the kingdom, and nearly the whole remaining portion, which is hand-made, is sent to Central or South America, for making cigarettes. From Leghorn there are also some exports of hand-made writing-paper, exported either to South America or to the East, but in much smaller quantities than formerly. It is the same with the port of Ancona and Venice. Naples exports machine-made paper to Greece, and has besides an annual sale of a special character of about 800,000 kilos. of very thin machine-made paper, used to wrap up oranges, lemons, &c., coming from the Two Sicilies, and afterwards despatched to the rest of Europe and America.

Regarding the quality of the Italian paper, we must notice that about one-half is paper made by hand, and that a certain quality is much esteemed for its good manufacture and its toughness, particularly that which is made in Tuscany.

Several manufactories, where only hand labour is employed, are reduced however to making wrapping paper only, and amongst these the paper works at Lucca, which principally make paper from straw, at very low prices. Paper mills, worked by machinery, established particularly in Piedmont, Tuscany, and Naples, have attained a degree of perfection in their fabrics which approach very nearly the best foreign paper. But unless large capital is employed, and the export duties of rags placed on a level with those of the neighbouring countries, the manufacture will not attain that degree of extension which the natural advantages of the country (abundance of clear water and raw material), would lead one to expect.

The paper works produced in Italy are not exported, but all used in the home market, where they can scarcely bear competition with similar French articles, either as relates to elegance or cheapness. Nevertheless, at Turin, Florence, and Milan, there are establishments whose productions were justly appreciated at the Italian Exhibition of 1861, and the absence of which at this International Exhibition we regret to indicate.

The typographic art assumed from the first a high position in Italy, which it has maintained in a splendid and flourishing manner for several centuries, in spite of many obstacles which the Church and other Governments have so frequently raised against it. At the end of the last century Bodoni, of Parma, with the most beautiful type known at that period, published some splendid editions, specimens of which are shown at the Exhibition, although not within the range of this class. At the present moment the art of printing in Italy has kept pace with the cause of liberty. Now it has assumed in Turin, Florence, and Milan, a position which is scarcely inferior to that which is enjoyed in any of the most favoured countries of Europe. Independently of these three large cities, every secondary city possesses a printing press; and many of them are important. Nevertheless, the number of printers who are exhibitors is small, compared with the number of those who might enter into competition; and amongst the articles exhibited a large portion comes from establishments of a

very different character, particularly from public libraries, probably because the works exhibited are more or less connected with education, and would accordingly be found under Class XXIX. In a typographical point of view, special attention may be directed to the small volumes in 48mo., printed by Barbéra, under the No. 1946; those of Cellini and Lemonnier, under No. 1952, 1966, may be pointed out; and those of Pomba, &c. One branch of typography, which has recently been greatly developed, is that connected with journalism, although the papers that have the largest circulation do not print more than from eight to ten thousand copies.

Binding has remained in an inferior state to what it is in France and England; and the reason is, we may repeat, in the superiority of the means which a large trade always creates. Nevertheless, some very good binding is done in Italy, but its high price prevents it from being within the reach of all classes. M. Binda, of Milan, and M. Vezzosi, of Turin, might have exhibited their very perfect works; whilst regretting their absence we have remarked an album of Fagioli and the small volumes of Barbéra, exhibited under No. 1922, which have been bound in parchment, by Tartagli, in a manner both novel and elegant.

## SECTION I.

### PAPER AND PAPETERIE.

**1926.**—1722\*. APPIANI AND  
DUCCI, FRANCESCO AND ODO-  
ARDO, *Florence*.

Die for stamping in different colours,  
for offices, &c. Price from 4s. to  
13s.

Printing ink.

**1927.**—1703. AVONDO, BRO-  
THERS, *Turin*.

Different sorts of paper.

**1928.**—1723\*. BOLLINI, PIETRO,  
*Milan*.

Powder to make ink by simply  
adding water.

**1929.**—1695bis. DENCI, SERAFINO,  
*Sartiano (Florence)*.

Several qualities of paper.

**1930.**—1695. GHIGLIOTTI, BAR-  
TOLOMEO, *Pegli (Genoa)*.

Samples of hand-made paper.

**1931.**—1706. MAFIZZOLI,  
ANDREA, *Toscolano (Brescia)*.

Various sorts of paper.

**1932.**—1698. MAGLIA, PIGNA,  
AND Co. *Milan*.

Official letter paper, for registries,  
and printing, white and coloured.

Lithographic paper.

Small cards for photographs.

Chamois for drawing.

This manufactory, situated at Vapria, em-  
ploys about 420 workmen, foremen, &c.,  
working up 1,200,000 kilos. of raw material,  
at a value of £4,000, with a produce of  
£58,000. Two machines are continually at  
work, 4 turbines, and 1 hydraulic wheel.

**1933.**—1705. MAGNANI, GIORGIO,  
*Pescia (Lucca)*.

Hand-made paper.

**1934.**—1704.\* MAGNANI, ENRICO,  
*Florence*.

Imperial paper of various qualities.  
Medium paper, large, of various  
qualities.

Genoese paper, large, of various  
qualities.

**1935.**—1698 bis.\* MEONI, GRE-  
GORIO, *Florence*.

Paper for protocols.

Do. drawing.

Do. blotting.

**1936.**—1697. MOLINA, PAOLO  
ANDREA, *Milan.*

Samples of pulp for paper.  
Common paper.  
Fine paper.  
Superfine paper.

**1937.**—1700. PICCARDO, AL-  
BERTO, *Genoa.*

Samples of paper.

**1938.**—1701. PLONCHERI, GIO-  
VANNI, *Chiavenna.*

Cards of incombustible asbestos.

**1939.**—1702. POLI, ANTONIO, *Villa  
Basilica (Lucca).*

Straw paper of two qualities; price  
3d. to 5d. the kilo.  
Straw card; price 3d. the kilo.

**1940.**—1707.\* POLLERA, ANDREA  
MARIA, *Lucca.*

Hand-made paper, sky blue and  
white, of various qualities.

	kilos.	Bundle of 20 Reams.
<i>Al musso</i> , 1st quality.....	108-60	16 1 0
„ 2nd quality ...	102	5 0 10
„ white.....	91-70	4 14 1
„ Genoese white	188-50	3 12 3
<i>Alle lune</i> , white, 1st qual.	88-30	4 0 8

**1941.**—1707 bis. SIMONI AND SONS,  
*Forlì.*

Paper.  
Cards.

**1942.**—1708.\* SORVILLO, NA-  
TALE, *Naples.*

Paper of different sorts, for placards,  
registers, printing, lithography,  
correspondence, cardboard, &c.

**1943.**—1709.\* VOLPINI, CESARE,  
*Florence.*

Paper hangings, engravings, and  
pictures.  
Paper for government offices and  
letters.  
Cards of various sorts.  
Paper for packing oranges, lemons,  
&c.

## SECTION II.

## PRINTING, CALCOGRAPHY, LITHOGRAPHY, &amp;c.

**1944.**—1740. BARBERA, GASPARE,  
*Florence.*

Mahogany box, inlaid in *pietra  
dura*, containing 49 volumes of  
the diamond edition, bound by  
M. Tartagli.  
86 unbound volumes.

**1945.**—1710. BENTIVOGLIO, C.,  
*Modena.*

Natural drawing, obtained by com-  
pression.

**1946.**—BERNARDONI, GIUSEPPE,  
*Milan.*

Specimens of printing.

**1947.**—1712. BOZZINO, ULISSE,  
*Milan.*

Specimens of chromo-lithography.

**1948.**—1724.\* CANTI, GIOVANNI,  
*Milan.*

Musical works.

The establishment of M. Canti is noted for getting up elementary works; its catalogue contains 5,000 various publications. In 1858 M. Canti instituted a free school for musical engraving.

**1949.—2010.\*CAPURRO, Niccolò, Pisa.**

Rosini, Giovanni—Il secolo di Leon X., Poemetto. Pisa, dalla tipografia della società letteraria. 1803, in fol. Impresso coi caratteri dei fratelli Amoretti di Parma.

La Divina commedia di Dante Alighieri con illustrazioni. Pisa dalla tipografia della società letteraria. 1804, e seg. Il solo primo volume col ritratto di Dante inciso dal Morghen, e il rame esprimente la morte del Conte Ugolino disegnato da Sabatelli, e inciso dal Bettelini.

L'Orlando furioso di Lodovico Ariosto. Pisa dalla tipografia della società letteraria 1809, in fol. Il solo volume 1° col ritratto dell'Ariosto inciso dal Morghen.

Bacco in Toscana. Ditirambo di Francesco Redi. Pisa, presso Niccolò Capurro, 1820, in-fol.

Poesie di Caio Valerio Catullo veronese, scelte e purgate, volgarizzate dal cav. Tommaso Puccini di Pistoia. Pisa con i caratteri dei fratelli Amoretti 1815, in fol.

**1950.—1768. CELLINI, MARIANO, Florence.**

Rime di Dante Alighieri e di Gianozzo Sacchetti; edite per Francesco Palermo. Firenze 1850. Volume unico in-4° massimo. Copia distinta.

Iscrizioni Etrusche e Etrusco Latine, in monumenti ec. della Galleria di Firenze, edite e illustrate dal conte Gian Carlo Conestabile. Firenze 1858, in-4° massimo con atlante separato.

I Manoscritti Palatini di Firenze, ordinati ed esposti da Francesco Palermo.

Volume primo, Firenze, 1853;

Volume secondo, idem 1860. (Opera in corso.) In 4° massimo.

Classazione dei Libri a stampa della Biblioteca Palatina, in corrispondenza di un nuovo ordinamento dello scibile umano, di Francesco Palermo. Firenze 1854. Un volume in-8° massimo.

Saggi di naturali Esperienze fatti nell' Accademia del Cimento. Firenze, 1841, in-4° massimo.

Atti della terza Riunione degli scienziati Italiani in Firenze. Volume unico in-4° massimo, legato alla bodoniana, 1841.

Statuti inediti della Città di Pisa, dal XII al XIV secolo, raccolti e illustrati per cura del prof. Francesco Bonaini. Vol. I e III Firenze, 1854.

Notizie sulla Storia delle Scienze Fisiche in Toscana, opera di Giovanni Targioni Tozzetti. Firenze, 1854. Un volume in-4° massimo.

Opera a ben vivere di S. Antonino Arcivescovo di Firenze ec. edita per Francesco Palermo, 1858, in-8° massimo.

**1951.- 1793 bis. — FLORENCE (GALLERIA DEGLI UFFIZI).**

Musei etrusci quod Gregorius XVI Pont. Max. in aedibus vaticanis constituit, monumenta, linearis picturae exemplis expressa, et in utilitatem studiosorum antiquitatum et bonarum artium publici juris facta. Ex aedibus vaticanis, 1843. (Two volumes grand in-fol.)

Descrizione del Campidoglio di Pietro Righetti. Roma, 1843.

Luca Longi illustrato dal conte Alessandro Cippi, edizione del quattrocento, venticinque copie, con tavole in sul rame e in sul l'acciajo. Ravenna pe tipi del Seminario Arcivescovile, 1853, a

spesa e cura dell' autore. Volume in folio.

L' I. e R. Galleria dei Pitti illustrata per cura di Luigi Bardi. Firenze coi tipi della Galileiana 1837-42. 4 Volumes in-folio, bound, with plates.

I. et R. Galleria di Firenze pubblicata con incisioni in rame da una società sotto la direzione di L. Bartolini, G. Bezzuoli, e S. Jesi, ed illustrata da Ferdinando Rannalli. Firenze presso la società editrice, coi tipi di V. Batelli e Compagni, 1841-62, (Fascicoli 96 in folio con incisioni in rame).

Monumenti Etruschi, o di Etrusco Nome, disegnati, incisi, illustrati e pubblicati dal Cav. Francesco Inghirami. Tomi sei, divisi in dieci parti. Badia Fiesolana, dai torchi dell' autore, 1821-25, 4to.

Zwölf Bas-reliefs griechischer erfindung aus Palazzo Spada, dem capitolinschen Museum, and Villa Albani Herausgegeben. durch das Institut für Archaeologische correspondenz. Rom. Gedruckt bei Salviucci 1845. 1 vol. in large folio with engravings.

**1952.—1797.\* FLORENCE LIBRARY OF THE ACADEMY OF FINE ARTS.**

Museo Borbonico. — Napoli (in course of publication).

The ornaments of the choir of St. Peter at Perugia, carved in wood, by Stephen of Bergamo, after Raffaello's designs. Rome, 1845.

Gravina. Il duomo di Monreale illustrato.—Palermo, 1859.

Homere — Iliade poliglottes with wood-cuts. Nemi Batelli, Florence, 1857.

Zuccagni Orlandini. — Corografia d'Italia, Firenze, 1845.

**1953.—2221.\* FLORENCE ARTISTIC SOCIETY.**

S. Marco Convento dei P. P. Predicatori in Firenze illustrato. Prato, Passigli.

**1954.—1796.\* FLORENCE ROYAL LIBRARY OF THE RICCARDI PALACE.**

Vernaccia cav. Francesco.—Sala di Luca Giordano illustrata, Firenze, 1822, Piatti.

The drawings are from the pencil of Vincent.

**1955.—2226.\* FLORENCE ROYAL MARUCELLIAN LIBRARY.**

La Divina Commedia di Dante Alighieri con le incisioni dello Ademollo e del Nenci. Tipografia del l'Ancora. Firenze, 1817. Volumi tre.

Istituto Archeologico Romano. Annali di Roma. Salviucci, 1829 e seg. In course of publication. vol. 4.

**1956.—2322.\* FLORENCE LIBRARY OF THE HOSPITAL OF SANTA-MARIA NUOVA.**

Mascagni Paolo. — Anatomia Umana. Pisa, Capurro, 1823 e seg.

Scarpa Antonio. — Riflessioni ed osservazioni anatomico-chirurgiche sull' aneurisma. Pavia, 1804.

Scarpa Antonio.—Memorie anatomico-chirurgiche, Milano.

**1957.—FLORENCE ROYAL DEPOSITORY (suppressed).**

Carta geometrica della Toscana, ricavata dal vero nella proporzione di 1 a 200,000, dal prof. cav. P. Giovanni Inghirami D. S. P. Firenze, 1830.

*Carta geometrica della Toscana, accresciuta di indicazioni ed incisa da Girolamo Segato. Firenze, 1832; e nell'anno 1844, aumentata e corretta per servire di corredo al Dizionario geografico storico di Emanuele Repetti.*

**1958.**—1715. GIOZZA, GIUSEPPE, *Turin.*

Specimen of a new method of stereotyping.

The stereotyping processes are reducible to two: First that of paper, which does not well reproduce vignettes, or the finest impressions, because the paper does not penetrate so well into small cavities, like plaster. Secondly that of plaster, more perfect but more costly.

The inventor has found the means of making plaster moulds much less than a half-millimetre in thickness, the old-fashioned ones being many centimetres thick, which renders it very difficult to get rid of the humidity; this mould hardens and dries in a few minutes, and does not again change; it is not necessary that in this process all the white parts, squares, spaces, &c., should be cast higher than ordinary; and there is no need of ovens, nor of turning; it is superior to all the others in speed, economy, simplicity, and precision. The inventor has left off the paper process for 10 years.

**1959.**—1725.\* GRAVINA, DOMENICO, *Palermo.*

Illustration of the Cathedral of Montreal, printed in chromolithography. (See No. 1797.)

**1960.**—1725 *bis*.\* GUAGLIA, FRANCESCO, *Turin.*

Gothic alphabet, with separate letters for bookbinding.

Seals with numbers.

**1961.**—1745. GUIDI, G. G., *Florence.*

Musical works.

**1962.**—1746. JERVIS, W. P.,  
Collection of the entire Italian newspaper press.

**1963.**—1747. LE MONNIER, FELICE, *Florence.*

National library of Italian writers. 43 vols. in 16mo. are sent, out of the 350 belonging to the collection.

**1964.**—1771.\* LO FASO PIETRASANTA (DUKE OF SERRADIFALCO), *Palermo.*

Le antichità della Sicilia esposte ed illustrate per Lo Faso Pietrasanta Duca di Serradifalco, *Palermo.*

Del duomo di Monreale, e di altre chiese siculo-normanne, ragionamenti tre per Domenico-Lo Faso Pietrasanta, duca di Serradifalco. *Palermo, Roberti.*

Vedute pittoriche degli antichi monumenti della Sicilia, sopra i disegni del duca di Serradifalco. *Palermo, B. Virzi.*

**1965.**—1748. LUCCA, FRANCESCO, *Milan.*

Printed musical works.

The establishment of M. Lucca possesses 15 calcographic presses and a music copying machine, employs 100 workmen, and carries on a very extended commerce in music with foreign parts.

**1966.**—1748. MARIETTI, GIACINTO, *Turin.*

Biblia sacra vulgatæ editionis. Sixti V. Pontificis maximi, insurecognita et Clementis VII., auctoritati edita.

Taurini, ex-officina stereotypographica Hyacinthi Marietti.

**1967.**—1716. MECHITARISTI FRIARS, *Venice.*

The Prayers of S. Narsete, printed in 24 languages, 8vo. volume; Venice, 1837.

Geographical Atlas with Armenian text; Venice, 1839.

Milton's Paradise Lost, translated into Armenian; Venice, 1861.

**1968.—NISTRI, BROTHERS, Pisa.**

Da Buti Francesco Commento alla divina commedia di Dante Alighieri Pisa, fratelli Nistri.

Bombicci Luigi. La Classazione dei minerali (Adottata nella Università di Pisa); Pisa, fratelli Nistri in folio, 1861.

**1969.—1716 bis. PANCIATICI, XIMENES, MARQUIS, Florence.**

Niccolini I monumenti di Pompei, Napoli, 1855.

**1970.—1717. PARIS, ACHILLE, Florence.**

Drawings and engravings which form part of the work.

La Galleria di Firenze detta degli Uffizi.

Drawings for this work.

Plans for chromolithography.

**1971.—PISA (LIBRARY OF THE UNIVERSITY OF)**

Notizia dei Vasi dipinti rinvenuti a Cuma, nel 1856, posseduti da S. A. R. il conte di Siracusa. Napoli, tipogr. Nobile, e litografia Richter; in-f.

Code Napoleon, printed at Pisa, by the Literary Typographical Society, 1809. With portrait of Napoleon I., engraved by R. Morghen. Folio.

**1972.—1788. PROSPERINI, P., Padua.**

Lithographs, chromo-lithographs, lithographic stones.

**1973.—1719. RICCO, FELICE, Modena.**

Specimens of printing and engraving natural objects on any metallic plates, by means of direct pressure.

Improvement of Auer's method.

Metallic printing plates.

**1974.—1756. RICORDI, TITO, Milan.**

Various printed operas.

Ricordi's establishment commenced in 1808; it has published 36,000 operas, possesses a rich stock of musical manuscripts, amongst which are 400 autographs of the most celebrated masters, and supplies the demands of managers and musical amateurs in every place. More than 100 workmen are employed—engravers, writers, printers, &c. It has many branch houses.

Musical printing employs at Milan 300 workmen, divided into 4 establishments, at wages of 10*l.* to 2*s.* 6*d.*, 2*s.* 11*d.*, 3*s.* 9*d.* The presses are made in Italy. The products are worth nearly £60,000; and the printed works are exported to England, France, Spain, Portugal, Germany, Greece, Turkey, America, &c.

**1975.—ROSELLINI, GIUSEPPE, Pisa.**

I monumenti dell' Egitto e della Nubia disegnati dalla spedizione scientifico letteraria in Egitto, distribuiti in ordine di materia ed illustrati da Ippolito Rosellini. Pisa, presso Capurro, in 8vo, 1832-44.

Atlante dei Monumenti Storici, Monumenti Civili, e Monumenti del culto dell' opera d'Ip. Rosellini i Monumenti dell' Egitto e della Nubia. Pisa, pressa Capurro, 3 vols., in f. massimo, 1832-44.

Geographical, topographical, and hydrographical maps.

**1976.—1720. SALARI, RAFFAELLO, Florence.**

Works in mimotypography, or *fac-simile* reproductions.

**1977.—2321.\* ARTISTIC SOCIETY OF FLORENCE.**

S. Marco Convento dei P.P. Predicatori in Firenze illustrato. Prato-Passigli.

Galleria dell'Accademia di Belle Arti &c. See No. 1953.

**1978.**—1759. TIMON, ANTONIO,  
*Cagliari.*

Various printed works.

**1979.**—1729.\* TREVES, MARCO,  
*Padua.*

Lithography, chromo-lithography.  
Lithographic stones.

**1980.**—1721. VALABREGA, G.,  
*Bologna.*

Compositor's table.

**1981.**—1713. COMIENTI, GIUSEPPE,  
*Milan.*

Lithographic specimens of Lombard  
Palæontology, executed directly  
from nature on the stone.

## SECTION C.

### BINDING, PASTEBOARD.

**1982.**—1730. BIANCONCINI,  
LUIGI, *Naples.*

Two volumes bound in morocco.

**1983.**—1731. ELISEO, DOMENICO,  
*Campobasso.*

Binding of the work (Descrizione  
delle acque Termo-minerali del  
l'isola d'Ischia.

**1984.**—1732. FAGIUOLI, GIU-  
SEPPE, *Florence.*

Morocco photographic album, for  
200 portraits.

Cover of a book of the Riccardi  
Library (*Guerino il Meschine*),  
in the 15th century style.

**1985.**—1714. GAMBERINI, DO-  
MENICO, *Ravenna.*

Designs cut out of paper (Papyro-  
graphie).

**1986.**—1696. JACOB, LUIGI, AND  
Co., *Milan.*

Album of 100 samples of paper.  
Rolls of paper corresponding to  
those of the album.

**1987.**—1726\*. LIVIZZANI, ER-  
COLE, *Bologna.*

Three papyrography drawings.

**1988.**—1698. MARTELLI,  
DEMETRIO, *Florence.*

Albums of various sorts, in coloured  
paper.

**1989.**—TARTAGLI, GAET-  
TANO, *Florence.*

Parchment binding.

(See No. 194.)

## CLASS XXIX.

### EDUCATIONAL WORKS AND APPLIANCES.

Class XXIX. has been viewed very differently in Italy by those who might have had an interest in appearing in it, and by the Sub-Committees who have superintended the collection and selection of the articles to be sent to the Exhibition. A great discrepancy has necessarily resulted; the class being very much better represented in some districts than in others; but nowhere perhaps in a way to give a more true idea of the state of education in general, and of the direct and indirect appliances employed in all their various degrees and in so many diversified forms.

If the adverse influences which have for so long a period thrown impediments in the path of the development of public prosperity in Italy, and tended to misdirect and to neutralise the efforts made, have been patent to us in the examination we have made of other classes, it would have been especially true of the articles contained in Class XXIX., had not the genius of the nation, with all its historical traditions—which have been and still continue to be its best safeguards—opposed an insurmountable barrier to the efforts of its oppressors. If the Exhibition had been more complete it would have demonstrated a continual tendency to sow discord, and to curb the genius of our countrymen on the one hand; and on the other it might have shown the unswerving resistance opposed to these efforts, illustrated by a multitude of works and institutions, strengthened by recollections of the past, starting up unexpectedly and as speedily perishing under the influence of discouragement and neglect: notwithstanding the opposition they have met with, the educational efforts made prove that the energetic aspirations after a new future have continued unimpaired. It would have shown the great dissimilarity in the exertions which have produced the present condition of education, so unequally diffused and so variously developed in its range, direction, and appliances throughout various parts of Italy; but together with an extensive knowledge of the methods practised abroad, we should have found new methods, and a large number of remarkable essays, and works of instruction and education, and a great many institutions, the origin of which is of high antiquity, and to whose ancient glories may be added the honourable distinctions of the present; and we should have seen that they indicate the decided advance of the nation in the path of progress.

We shall here enumerate the articles exhibited, reserving to a future opportunity the privilege of giving more special information

#### SECTION I.

##### BOOKS AND EDUCATIONAL APPARATUS IN GENERAL.

##### § BOOKS AND APPARATUS FOR PRIMARY INSTRUCTION.

1990.—1762\*. ABBATE, GIUSEPPE, *Messina*.  
Specimen of caligraphy.

1991.—1766\*. BOTARELLI, PASQUALE, *Valiano*.

New caligraphic method.

1992.—1781. CAPURRO, GIOVANNI FRANCESCO.

Telegraphic alphabet, adopted by the Novi schools.

Rapid and efficacious method of teaching a large number of scholars at once.

Figured syllables.

Telegraphic alphabetic cards.

**1993.**—1765. CARUTTI, GAETANO, *Cuneo*.

Drawing-book with illustrations.

**1994.**—2318. LAMBRUSCHINI, CAV. RAFFAELLO, Senator, *Florence*.

Educational works.

(See Prize List of the London Exhibition.)

**1995.**—1797. MESSINA (SUB-COMMITTEE OF).

Caligraphic exercises; price £1.

**1996.**—1774\* MUZZI, LUIGI, *Florence*.

Phonic method of teaching reading.

For fifty years the author has left off the common method of spelling, as both illogical and pernicious. To follow the phonic method, the scholar must learn, before anything else, the sound and the name of vowels exclusively, and the sounds of their various combinations with the consonants. The names of these last are only learnt at the end.

**1997.**—1753. PINELLI, LEOPOLDO, *Florence*.

Evangelical books of civil and religious instruction, prayers, &c.:—

Lucia, storia di una famiglia inglese nel 1849.

Ternari Sacri, &c., &c.

Compendio di Dottrina cristiana.

Nuovo Testamento (Diodati).

Inni e Cantici.

Vigilie Mattutine, &c., &c.

Commentario sull'Epistola di S. Paolo ai Romani.

Il vero patrimonio di S. Pietro.

Discorsi Religiosi, &c., &c.

**1998.**—1775.\* RAMO, STANISLAO, *Naples*.

Educational works.

**1999.**—1777. SANTERINI, BROTHERS, *Cesena*.

Specimens of caligraphy.

**2000.**—1778.\* TENERELLI, FRANCESCO, *Teramo*.

New method of learning to read Italian in one month.

**2001.**—1760. TRON, GIOVANNI, *Turin*.

Evangelical works:—

Nuovo Testamento (Diodati) Torino, in 8vo, 1860.

Nuovo Testamento (Diodati) Firenze, in 12mo, 1860.

Il compagno della Bibbia. Torino, in 12mo, 1858.

Burnier, Studi elementari e progressivi della parola di Dio. Torino, 3 vol. in 12mo., 1858.

Manuale della Bibbia di Angus. Genova, 1861.

Primo libro di lettura per le scuole. Torino, 1859.

Catechismo della chiesa valdese. Torino, 1860.

Dottrina cristiana. Torino, 1860.

Inni e cantici con musica. Torino, 1853.

La Donna; due discorsi di A. Monod. Torino, 1858.

Lucilla; di A. Monod. Torino, 1860.

Il Padre Clemente. Torino, 1859.

*Regula fidei*. Torino, 1828.

Le ministres et les prêtres, par I. Curie.

La messa di L. Desantis. Torino, 1861.

Storia della Riforma in Italia, di Mac Crie. Torino, 1859.

- Porro-unum excommunico vos. Firenze, 1859.
- Impossibilità del Viaggio di S. Pietro a Roma. Torino, 1861.
- Il purgatorio, di L. Desanctis. Torino, 1860.
- Atto di accusa contro i papi di Roma. Torino, 1859.
- L'amico di Casa. Almanacco del popolo. Torino.
- Viaggio del cristiano. Torino. 1858.
- Psaumes et cantiques. Turin, 1859.
- Istruzioni religiose pei fanciulli. Torino, 1859.
- § 2. BOOKS AND DRAWINGS FOR TECHNOLOGICAL AND EDUCATIONAL PURPOSES.
- 2002.**—1763.\* ARCOZZI MASSIMO, LUIGI, *Milan*.  
Practical treatise on rearing silkworms.
- 2003.**—2320. TYPOGRAPHICAL ASSOCIATION OF TURIN.  
Educational works.
- 2004.**—1764\*. BOLOGNA (SUB-COMMITTEE OF), *Bologna*.  
Memoirs of the Medico-Chirurgical Society of Bologna.
- 2005.**—1767\*. CASTIGLIONI, PIETRO, *Milan*.  
Trattato popolare della monarchia parlamentare.
- 2006.**—1769\*. CIVELLI INSTITUTION, *Milan*.  
Geographical school Atlas.
- 2007.**—1757. ROYAL COMMISSION FOR THE ITALIAN EXHIBITION OF 1861.

Collection of official acts of the Royal Commission (cheap edition).  
Do. (fine edition).  
System of classification.  
Specimens of forms used.  
Plan of the Exhibition building.  
Official catalogue of the articles exhibited at the first Italian Exhibition.  
Specimens of the tickets, numbers, and marks employed in the Exhibition.  
Critical descriptive guide to the Exhibition.  
Complete collection of the Reports of the Juries of the 24 classes.  
Medal commemorating the Exhibition.  
Prize medals for exhibitors and workmen.  
Diploma for exhibitors.  
Do. workmen.  
Illustrated newspaper of the Italian Exhibition.  
Collection of photographs, representing the principal views of the Exhibition building.

**2008.**—1742. DELLA BEFFA, GIACINTO, *Florence*.

Atlante di Storia naturale.  
Atlas of Natural History, with a volume of text exclusively compiled for teaching the elements of the science in schools, and recommended to the masters of public schools by Commendatore Aporti, president of the permanent commission for the inspection of secondary studies.  
Antologia Italiana per le scuole elementari superiori e tecniche, con un giudizio ed un indice sui più rinomati scrittori italiani dal decimoterzo al decimonono secolo  
150 themes for teaching to compose good Italian, intended for schools, with a critique on the most celebrated Italian authors from the 13th to the 19th century.

**2009.**—1728.\* ROYAL MILITARY ENGINEER CORPS, *Naples.*

Topographical maps.

**2010.**—1727.\* ROYAL MILITARY ENGINEER CORPS, *Turin.*

Geographical, topographical, and hydrographical maps.

**2011.**—1743. FERRARIS, CESARE, *Alexandria.*

Dei rapporti della medicina colla società e specialmente dell' educazione fisica, del dottore Cesare Ferraris, medico del civico ospedale di Dronero.

**2012.**—1744. GICCA, ALESSANDRO, *Turin.*

Elementi di economica politica sommariamente esposti.

**2013.**—1746. JERVIS, W. P.

Collection of all the journals published in Italy, classified according to their political tendencies. (See Class XXVIII., No. 1962.)

**2014.**—1773. MIGLIACCIO, RAFFAELLE, *Salerno.*

Alcaldi, Poesie. Salerno, 1860.  
Centofanti Silvestro.—Saggio sulle vite di Plutarco. Salerno, 1855.  
Scripando. Poetiche. Salerno, 1858.  
Spemati. Questioni di diritto canonico. Salerno, 1858.

**2015.**—1750. NAPLES (SUB-COMMITTEE OF).

Tradi (Niccola). Dei determinanti e loro applicazioni, 1 vol. 8vo.  
De Luca (Cav. Ferdinando) Geografia, 1 vol. 8vo.

Del Grosso (Remigio) Elementi di Statica; Elementi di Navigazione, 1 vol. 8vo.

Zanetti (Prof. Michele) Algebra, Meccanica, Fisica, Trigonometria, 6 vols.

De Luca (Giuseppe) Geografia, 1 vol.

Nucci (Prof. Francesco Paolo), Calcolo differenziale ed integrale. 1 vol. 8vo.

Cappi (Prof. Raffaele). Chimica. 1 vol. 8vo.

Napoli (Raffaele). Chimica. 1 vol. 8vo.

Presutti (Prof. Domenico). Medicina legale. 4 vols. 8vo.

Minichini (Cav. Domenico). Filologia, 2 vols. Igiene pubblica e privata, 2 vols. Scuola del Giovine medico, 2 vols.

Capobianco (Prof. Raffaele). Medicina pratica. 1 vol. 8vo.

De Nanzio (Cav. Ferdinando). Esippognosia. Conoscenza esterna del cavallo. Trattato di ferratura, 1 vol.

Mammone Capria (Domenico). Chimica. Dizionario chimico.

Rodino (Leopoldo). Grammatica italiana, 1 vol.

De Stefano. Grammatica italiana, 1 vol.

Giordano (Prof. Giuliano). Trattato elementare di fisica. 2 vols. 8vo.

Tenore (Vincenzo). Botanica. 1 vol. 8vo.

Tenore (Gaetano).—Mineralogia e geologia, 1 vol. 8vo.

Bruni (Achille).—Agricoltura, 1 vol.

Rubini (Raffaele).—Geometria, analitica, appendice alla geometria di Legendre, aritmetica, trigonometria, algebra, 3 vols.

Mirabella (Ab. Antonio).—Opere d'istruzione letteraria.

De Sanctis (Tito Livio).—Elementi di chirurgia, 1 vol.

D'Andrea (Carlo).—Algebra, meccanica applicata.

- Di Martino (Antonio).—*Filologia*.  
1 vol. 8vo.
- Fabiani (Cav. Antonio).—*Istituzioni di procedura civile*, 1 vol.
- Matera (Leonardo).—*Trigonometria*. 1 vol.
- Leibnitz.—*Grammatica francese*. 1 vol.
- De Benzis (Felice).—*Trattato di chirurgia*, 4 vol.
- Dal Giudice (Cav. Francesco).—*Ammaestramenti dell' arte di spegnere gli incendi ed usare i partiti di salvezza per uomini e cose*. Published at the expense of the town. Napoli, 1851.
- Manuale pratico popolare per gl' incendi. Prize essay at the Academy of Sciences of Bologna. Napoli 1853.
- 2016.**—1751. PAGANUCCI, (Prof. LUIGI), *Florence*.  
Drawings of anatomy applied to the fine arts; in process of publication.
- 2017.**—1786. PAVIA, ROYAL UNIVERSITY OF). *Machinery department*.  
Drawings rapidly executed, for aiding teachers, as employed in the school for constructing machines, under the direction of M. Codazza.  
Withlaw's turbine.  
Tangential zone.  
The drawings are executed on coloured paper, on a ground of gum, with colours dissolved in gum-water.
- 2018.**—1754. PUCCINELLI, MARIA. *Lucca*.  
Osservazioni sui Funghi dell'Agro luccese.  
An unfinished work of the late M. Puccinelli, professor of botany and agriculture at the Lucca Lyceum, and author of many important works on the flora of the province of Lucca; died in 1850.
- 2019.**—1755. RABBINI, Cav. ANTONIO, *Turin*.  
Topographical survey.  
Original map.  
Trigonometrical and planimetical plans.  
Field books.  
(See Class X., No. 1310.)
- 2020.**—1776.\* RIZZETTI, D. GIUSEPPE, *Cagliari*.  
Trattato popolare d'igiene privata e pubblica, del Dottore Giuseppe Rizzetti; chiefly with the view to ameliorate the condition of the agricultural and industrial population.  
This work obtained the Strada prize, and is recommended by the Minister of the Interior to the Mayors of Italy.  
Sull' alimentazione delle classi popolari del Dottore Giuseppe Rizzetti. Torino, 1857.  
Sunto delle lezioni di chimica del Dottore Guiseppe Rizzetti. Cagliari, 1861.
- 2021.**—1758. SANSEVERINO, FAUSTINO, *Turin*.  
Studi sulla popolazione della città di Milano.
- 2022.**—2347.\* SCACCHI, SENATOR Prof. ARCANGELO, *Naples*.  
Crystallized salts, to assist in the study of crystallography.  
(See Naples, Mineralogical Museum of, Classes I. and II.)
- 2023.**—VIEUSSEUX, G. PIETRO, *Florence*.  
Educational works and various publications.  
(See Class XXVIII., under the heads Barbèra, Cellini, Guidi, Le Monnier, Lucca, Marietti, Ricordi, Sanseverino, Timon, and various Libraries, &c.)

**2024.—1779.\* VIGANO, FRANCESCO, Milan.**

La vera Carità per il popolo considerataneegli stabilimenti di beneficenza pubblica, secondo i bisogni di questo tempo, di Francesco Viganò.

Scienza del commercio di Ignazio Sonneleihnner, accompagnata da note, da una prolusione, da uno schizzo sulla storia dell' economia politica in Italia, e da un quadro delle pubbliche banche italiane antiche e moderne, con documenti inediti sulla banca di Venezia e di S. Ambrogio di Milano.

Nuovo Manuale di monete, pesi, misure, corsi di cambio, fondi pubblici ad uso dei banchieri, dei negozianti, e degli industriali di Nelkenbrecher. Translated from Dechamps edition, with additions.

Operaio agricoltore, manifatturiere e commerciale. A work for the labouring classes, intended to instil into them industrious habits, order, probity, temperance, economy, and mutual aid.

Biblioteca dei negozianti.

Trattato volgare di economia politica abbreviato su quello di F. Wailand, presidente dell' Università di Brown degli Stati Uniti d'America, tradotto da F. Viganò.

Scienza commerciale del Brentano, tradotta dal tedesco per F. Viganò.

**2025.—2350.\* VILLA, Cav. IGNAZIO, Florence**

Universal clock.

Geographical, cosmographical, and cosmographical maps.

Drawing No. 1, or large terrestrial planisphere and universal clock.

This planisphere, once set in motion, represents instantaneously the hour of the day in every country and all the longitudinal differences of time. The ecliptic is marked in the centre, with the position of the sun for every day of the year. This drawing possesses many advantages over Mercator's chart, on account of the parallels not being interrupted.

Mechanism, applied to this hemisphere, converts it into a universal clock, which might be of essential service if set up in a public square, or institution. It may be made of the size of a common watch. M. Villa has exhibited three different clocks of this description.

Drawing No. 2, or great celestial planisphere, for nautical schools and for students in general.

This planisphere is intended to show at a single glance the relative position of the whole universe, so that at any given hour of the right ascension of any star, in mean time (to which sidereal time is reduced in a very simple manner), the constellations which pass through the meridian of the spectator may be seen; the culmination and the position of the planets are also given, without the necessity of any calculation.

This planisphere is of great use, by saving the preliminary calculations to ascertain the distances of the stars and the moon from the sun. It might be set up on board ship in a frame, on a pivot. By applying a clock movement with sidereal time, and by framing it in the manner above indicated, this apparatus becomes a perfect mariners' chronometer and compass.

Drawing No. 3, or great cosmographical map.

This drawing exhibits in the centre the solar system rotating on its orbit, the partial and total eclipses, phases of the moon, tides, refraction of light, night and day in the polar regions, and the position of the sun with reference to the poles, the signs of the zodiac, &c. Four globes in perspective are drawn in the four corners, two for the solstices, and two for the equinoxes, with their inclination to the terrestrial axis, and the curves indicating the real shadows thrown every day upon the earth.

Two synoptical tables are placed beneath, one indicating the lengths of the day and night for every parallel of latitude; the other presents an equatorial belt, divided into tropics, with a solar scale, by which the position of the sun in the zenith of the earth may be seen at once, i.e., the right ascension and declination of the sun for every day of the year.

Drawing No. 4, or large map, representing one-fourth of the terrestrial surface, seen in perspective.

This map is projected upon the plane of Paris, and is on a large scale for Europe.

graduating as far as Calcutta on the East, North America on the West, and extends as far south as the equator. On it are laid down the chief railroads and telegraphic lines of Europe, Asia, Africa, and America. This drawing represents the most interesting parts of the commercial world, projected at right angles, somewhat similar to a Mercator's chart. It affords facility for ascertaining the differences in time, whether east or west, caused by the earth's rotation between any two points, by taking the meridian of the spectator as zero. These maps have been purchased by the Italian Government to be placed in all the principal telegraphic stations in Italy.

Drawing No. 5, planisphere on the same principle as No. 1.

Attached to this planisphere is another, on the plane of the north pole; these planispheres are surrounded by eight drawings, showing (figs. 1 and 2) the theory of the winds, the distribution of terrestrial magnetism, and a statistical table of all the religions of the earth; figs. 3 and 8, the state of the earth's surface during the summer and winter solstices; fig. 4, the solar system; fig. 5, the chief rivers; fig. 6, the theory of the creation; fig. 7, solar and lunar eclipses; and figs. 9 and 10, the theory of rain and the theory of the temperature of the torrid, temperate, and frigid zones.

Drawing No. 6, another small celestial planisphere, similar to No. 2.

This represents the hypothesis of an electromagnetic fluid as the primary cause of the rotation of the celestial bodies.

Drawing No. 7, or universal meridian.

This meridian shows the equation of time, and serves for regulating clocks.

### § 3. MACHINERY, MODELS, AND COLLECTIONS OF NATURAL HISTORY.

#### 2026.—1780. CAIMI, EMILIO, *Sondrio*.

Model of the Pass of the Stelvio, shewing the great road.

#### 2027.—1790\* CALENZUOLI, CARLO AND SEBASTIANO, *Florence*.

Anatomical wax preparations.

Wax male figure, to take to pieces.  
Wax female figure.

Anatomy of the eye, the ear, the olfactory apparatus, the brain, &c.

MM. Carlo and Sebastiano Calenzuoli are Florentine artists, celebrated throughout the scientific world for their anatomical preparations, with which the principal collections in Europe and America are supplied.

#### 2028.—1791. CASELLA, GIUSEPPE, *Laglio (Como)*.

*Ammonites*.

*Ursus speleus* (bones).

#### 2029.—COCCHI, Prof. IGINO, *Florence*.

(See Florence Museum of Natural History, No. 3.)

#### 2030.—ENGINEERING SCHOOL. *Turin*.

Models of fossils in plaster.  
do crystals for illustrating crystallography.

(See Class I., No. 15.)

#### 2031.—GADDI, PAOLO, *Modena*.

Metallic injection of the auditory organs of man.

Different preparations.

#### 2032.—VETERINARY COLLEGE, *Parma*.

Monstrous fetus of a calf, in which the spine and viscera are reversed.  
Anatomical preparations.

Myology of the dog, after immersion in sublimate.

#### 2033.—1232. JEST, CARLO, *Turin*.

Collection of philosophical instruments for schools.

**2034.**—MAESTRI, DR. LUIGI,  
Pavia.

Wax preparations of the diseases of silkworms.

Reproduction of the *Cristatella mucedo*, &c.

(See Royal University of Pavia.)

**2035.**—2323.\* FLORENCE MUSEUM OF NATURAL HISTORY.

GEOLOGICAL DEPARTMENT.

Mineralogical and geological collections.

(See Class I. No. 134.)

ZOOLOGICAL DEPARTMENT.

Wax models of the oidium of grapes and its fructification, according to Amici, prepared by M. Tortoli.

Anatomy of the rabbit, prepared by MM. Tortoli and Piccioli.

BOTANICAL DEPARTMENT.

Central Herbarium.

Two packets of dried plants of the genus *Luzula*.

COLLECTION OF USEFUL PRODUCTS.

*Oryza*, L. Rice.

16 varieties of ears, from different countries.

12 varieties of rice, from Italy, China, East Indies, North America, Maracaibo, &c.

Semolina.

Rice starch.

*Lygæum Spartum*, L. Esparto.

Seeds and ears.

Rope made with Esparto fibre.

Paper made from the same.

*Zea mays*, Indian corn.

38 varieties of ears, of Indian corn, from various countries.

Fine semolina.

Average semolina.

Coarse semolina.

Two varieties of yellow flour.

Bread.

Bread made in Styria of the stalk of Indian corn.

Alcohol.

Oil.

Glumes for making sacking.

*Zea erythrolepis* (Bonaf.)

Three varieties of ears.

*Zea cryptosperma*.

*Coix Lacryma*, L. Job's tears.

Seeds.

Garland made of Coix seeds.

*Phleum asperum*, L.

*Phleum pratense*, L.

*Phalaris canariensis*, L. Canary-grass.

Ears.

Seeds from Sicily.

Seeds from Cagliari.

*Phalaris paradoxa*, Link.

Do. *sativa*.

Do. *tuberosa*, L.

*Holcus lanatus*, L.

Do. *mollis*, L.

*Anthoxanthum odoratum*.

*Sorghum Caffrorum*.

Do. *cernuum*.

Do. *compactum*.

Do. *Dourra*.

Do. *elongatum*.

Do. *glycichylum*, Passer. Saccharine sorghum.

Seeds of the same, from different countries.

Sugar.

Rum.

Alcohol.

*Sorghum nigerrimum*.

*Sorghum saccharatum*.

Inflorescence.

Ears.

Seeds.

Alcohol.

Brush.

Clothes brush.

Brooms.

*Sorghum vulgare*.

Five varieties, red, black, &c.

Sorgho bread.

*Andropogon Ischæmum*, L.

Roots and stalks.

Roots prepared for brushes.  
 Brushes made with the same.  
*Andropogon muricatus*.  
 Kuskus grass.  
*Andropogon Nardus*, L.  
 Roots.  
*Andropogon Schoenanthus*, L.  
 Roots.  
*Chrysopogon Grillus*, Trin.  
 Roots.  
 Horse and other brushes, made from these roots.  
*Saccharum officinarum*, L. Sugar-cane.  
 Stalks.  
 Stalks preserved in spirits of wine.  
 White Bengal sugar.  
 White sugar from Calcutta.  
 China sugar.  
 West India sugar.  
 Chinese sugarcandy.  
 Sugar candy from Mauritius.  
 Jamaica rum.  
*Erianthus Ravenneæ*, Rich.  
 Ears.  
*Gynierium saccharoides*.  
 Ears.  
*Panicum Crus Galli*, L.  
 „ *germanicum*, L. Red millet.  
 „ *Italicum*, L. Italian millet.  
 Three varieties.  
*Panicum miliaceum*, L. Millet.  
 Many varieties.  
*Monachyron roseum*, Parl.  
*Tricholena Teneriffæ*, Parl.  
*Pennisetum cenchroides*.  
 „ *longystilum*.  
 „ *setosum*.  
 „ *typhoïedum*.  
*Cenchrus echinatus*.  
 „ *tribuloides*.  
*Stipa pennata*, L.  
 Dusting brush made with the flowers.  
*Machrochloa tenacissima*, Kunth.  
 Ropes made with the fibres.  
 Matting of different colours, from Spain.  
*Agrostis vulgaris*, L.  
*Donax arundinaceus*, Beauv. Rushes.  
 Entire plants from Palermo and Tuscany.  
 Bird lime.  
 Small tubes.

Tubes and pipes.  
 Thick tubes.  
 Hearing tubes.  
 Reel for charging the bobbins.  
 Reel for raw silk.  
 Basket of split rushes, for strawberries, from Sicily.  
 Matting of different forms, from different countries.  
*Ampelodesmos tenax*, Link.  
 Stalks.  
 Small brooms.  
 Press.  
 Cages.  
*Phragmites communis*, Trin.  
 Stalks.  
 Brushes made with the panicle.  
 Matting of different forms.  
*Lorodopsis Blanchardiana*.  
*Cynodon Dactylon*, L. (Dog's-tooth grass).  
 Roots.  
*Aira capillaris*, Host.  
 Bouquet of *Aira capillaris* and *Bouiza maxima*, L.  
*Lagurus ovatus*, L.  
*Avena sativa*, L. Oats.  
 Many varieties from different countries.  
 Half-crushed groats.  
 Groat flour.  
*Avena segetalis*, L.  
*Sesleria elongata*, Host.  
*Catapodium siculum*, Link.  
*Dactylis glomerata*, L.  
*Lamarkia aurea*, Moench.  
*Festuca arundinacea*, Schreb.  
 „ *duriuscula*, L.  
 „ *heterophylla*.  
 „ *ovina*, L.  
*Brachypodium pinnatum*, Beauv.  
*Uniola latifolia*.  
*Bambusa arundinacea*, Bamboo.  
 Entire stalk of the plant, cultivated at Palermo.  
 Stalk from the East Indies.  
 Stalks from China.  
 Preserved bamboo from China.  
 Turkish pen.  
 Chinese bamboo pens, and handles for camels' hair brushes.  
 Two lacquer Chinese glasses.

- Two glasses worked in relief, from China.
- Two ornamental vessels from China.
- Two smaller vessels.
- Small basket, made in China.
- Do. do. Japan.
- Do. made at Calcutta.
- Do. from Japan.
- Scale box from China.
- Tabasker*, or siliceous concretion in the knots of bamboo.
- Root cut in the form of a dog.
- Do. birds.
- Bamboo matting.
- Seeds.
- Lolium perenne*, L. Ryegrass.
- " *italicum*.
- " *scitulum*, Parl.
- Triticum vulgare*. Wheat.
- Many varieties, with bearded or naked ears.
- Wheat of different countries.
- Flour of different qualities.
- Bran.
- Flour, and fine flour.
- Starch of different qualities.
- Wafers of different kinds.
- Fossil wheat of Sicily.
- Straw.
- Straw corks for flasks.
- Straw paper of different qualities and colours.
- Drawing in coloured straw.
- Architectural drawing in straw.
- Various straw works.
- Wheat straw for plaiting.
- Straw twist, plait, plumes, flowers, cigar-cases, frails, slippers, hats, buttons, rosettes, buckles, baskets, &c., made in Tuscany, Switzerland, &c., alone, either entirely of straw or mixed with hair, aloe, chenille, &c.
- Triticum monococcum*, L. in the ear.
- Triticum polonicum*, in the ear.
- Triticum Spelta*, L.
- Ears.
- Seeds in various states.
- Triticum turgidum*, L.
- Many varieties in the ear and seed.
- Bread of different countries.
- Biscuits of different kinds.
- Large collection of Italian paste, of every sort.
- Flour of different kinds.
- Alcohol from wheat.
- Secale cereale*, L. Rye.
- Rye ears and straw from different countries.
- Plaited Turkish slippers, hats, &c., in rye straw.
- Secale villosum*, L.
- Hordeum bulbosum*, L.
- Hordeum distichum*.
- Different varieties.
- Hordeum hystrix*.
- Hordeum vulgare*, L. Barley.
- Many varieties of barley from different countries.
- Ale.
- Porter.
- Burnt barley for coffee.
- Barley flour.
- Sardinian straw basket.
- Small straw box.
- Hordeum Zeocriton*.
- Various ears.
- Egyplops cylindrica*.
- " *ovata*.
- " *triticoides*.
- " *squarrosa*.
- Elymus Caput Medusæ*, L.
- " *europæus*, L.
- " *giganteus*.
- " *sabulosus*.
- " *virginicus*, L.
- Tripsacum dactyloides*.
- Lepturus cylindricus*, Trin.
- Lepturus incurvatus*, Trin.
- North American basket with ears of graminaceous and cyperaceous plants.
- 2036.**—1787. ROYAL NATURAL HISTORY MUSEUM OF PAVIA UNIVERSITY.
- Plaster models of fossil bones of *Elephas meridionalis*.
- Mastodon angustidens*.
- Hippopotamus major*.
- Rhinoceros etruscus*.
- Lutra*.
- Amphicyon*.
- Sus*.

The University of Pavia has sent these valuable models of a few rare specimens, but have been unable to furnish anything like a proper representation of the riches and extent of the museum.

**2037.—1297. ANATOMICAL MUSEUM OF THE ROYAL UNIVERSITY OF PAVIA.**

**ANATOMICAL DEPARTMENT.**

Dried preparation of a monstrous trunk, in which the viscera are transposed.

Preparation of the facial nerves.

Injection with glue of the blood-vessels of the lungs and pericardium.

Do. of the blood-vessels of the peritoneum.

Do. of the blood-vessels of the costal pleuræ.

Do. of the blood-vessels of the costal and visceral pleura.

Do. of the uterine cotyledons of the cow.

Do. of the foetal cotyledons of the calf.

Do. of the arterial, venous, and lymphatic vessels of the mesentery and intestina of a tortoise.

Wax injection of the lymphatic vessels of the bull.

Mercurial injection of the lymphatics of the dog.

Do. do. of the lymphatics of man.

Do. do. of the lymphatics of the bear.

Do. do. of the lymphatics of a part of the oviduct of the turtle.

Organ of hearing, executed in wax, by Senator Prof. B. Panizza.

**ZOOLOGICAL DEPARTMENT.**

Wax preparations representing the development of the silkworm, by M. Maestri.

Wax preparations representing the development of *Cristatella mucedo*, by M. Maestri.

**SURGICAL INSTRUMENTS.**

Articulated speculum, with three branches.

Lithotripsy trepan forceps.

Straight and curved instruments to extract calculi.

Bilateral knife, for fistular operations.

The Anatomical Cabinet of the University of Pavia, well-known for the anatomical preparations of its Professors Scarpa and De Panizza, includes many preparations in wax, irrespectively of objects of Natural History, prepared by those celebrated men. Professor Panizza has sent both kinds of preparations. The first are of the most delicate finish, the bloodvessels injected with vermillion, and the lymphatic vessels injected with mercury.

Another work, which reflects great honour upon him, is the perfect model upon a large scale, of the whole organ of hearing.

The models in wax of M. Maestri, chief preparer of specimens for the zoological cabinet of Pavia, are worthy of special mention, both for the labour bestowed upon them and the nature of the subjects to which it has been applied.

**2038. — PANIZZA, Professor, Pavia.**

(See Royal University of Pavia, No. 2037.)

**2039.—PARLATORE, Professor FILIPPO, Florence.**

(See Florence Museum of Physical Science and Natural History, No. 2,035.)

**2040.—2341\* RANDACIO, Professor GIOVANNI, Sassari.**

Wax preparations of human anatomy, representing—

Half a head, with the brain.

The pelvis and the inferior muscles, vessels, nerves, &c.

We regret deeply that the preparations in wax made by M. Giuseppe Randacio have been injured in the carriage, so that we are not able properly to appreciate the skill of the artist and savant.

**2041.—2345.\* RONDANI, CAMILLO, *Parma*.**

Collection of Italian dipterous insects.

Dipterologie italicae prodromus.  
Memorie dipterologiche.

**2042.—2335. SOCIETY FOR THE ENCOURAGEMENT OF ARTS AND MANUFACTURES, *Milan*.**

Plan, elevation, and section of Lenoir's gas machine.

Drawing of a ribbon saw.

Drawing of M. Lethuiller Pinel's magnetic water-gauge for steam-boilers.

Diagram of agricultural machines.

As regards other collections, we must refer to the following titles, distributed in different classes, with the numbers indicated.

ADMINISTRATION OF THE IRON MINES OF THE ISLAND OF ELBA. See No. 1.

ANZI, CAV. MARTINO. See No. 1151.

BANDIERI, GIOVANNI, *Naples*. See No. 1414.

BOLOGNA (AGRICULTURAL SOCIETY OF). See No. 1493.

BOTTER, PROF. LUIGI. *Bologna*. See No. 1494.

CALI, CARLO, *Catania*. See No. 2.

COCCHI, PROF. IGNO, *Florence*.

DÖDERLEIN, PIETRO. *Modena*. See No. 4.

FAA DI BRUNO, FRANCESCO. *Alexandria*. See No. 1412.

FALLICA, ANDREA, *Catania*. See No. 8.

FOICO, GAETANO, *Chiavenna*. See No. 5.

GAMBA, PIETRO, *Pietrasanta*. See No. 6, 1153.

GAROVAAGLIO, S. *Pavia*. See No. 7, 1784.

GONNELLA, PROF. TITO, *Florence*. See No. 1407.

LIPARI LOCAL COMMITTEE. See No. 9.

LUCCA SUB-COMMITTEE. See No. 10.

MARCHI, ULISSE, *Florence*. See No. 1416.

MURE, BROTHERS, *Turin*. See No. 1460.

NAPLES MINERALOGICAL MUSEUM. See No. 11.

ROBERTO, PAOLO, *Naples*. See No. 1413.

ITALIAN CRYPTOLOGICAL SOCIETY, *Genoa*. See No. 1154.

VILLA, ANTONIO AND BROTHERS, *Milan*. See No. 12.

**§ 4. BOOKS AND EDUCATIONAL APPLIANCES FOR THE BLIND AND DEAF AND DUMB.****2043.—BORSARI.**

Works on the instruction of the deaf and dumb.

**2044.—1782. FAA DI BRUNO, FRANCESCO, *Turin*.**

Writing machine for the blind.

This is an invaluable apparatus, enabling persons who have become blind to write in the ordinary character.

Apparatus for teaching persons born blind.

Machine to demonstrate the movement of the nodes, and the perigee of the moon, in astronomical schools.

Machine for demonstrating the phases of the moon.

Elipsograph.

Instrument for describing parabolas.

**2045.—2935.\* ROYAL DEAF AND DUMB INSTITUTION, *Milan*.**

Grammar for the deaf and dumb.

(See Pendola, No. 2047).

**2046.—MARZULLO, CIRO, *Palermo*.**

(See Pendola, No. 2047.)

**2047.—1752. PENDOLA (Prof. TOMMASO), *Sienna*.**

FROM THE MILAN ROYAL DEAF AND DUMB ASYLUM.

Compendio di Storia Sacra, ad uso specialmente dei sordo-muti, compilato dal Sacerdote Eliseo Ghislandi. 1 vol.

Catechismo ad uso specialmente dei sordo-muti, compilato dal Sacerdote Eliseo Ghislandi. 1 vol.

Opuscoli sui sordo-muti, del Sacerdote Eliseo Ghislandi. 1 vol.

Reports of the Deaf and Dumb Institute of Milan.

Rapporto della Commissione del primo Congresso pedagogico italiano, del Sacerdote Eliseo Ghislandi.

Sull' Istruzione dei sordo-muti, articolo del Sacerdote Eliseo Ghislandi.

#### FROM THE ROYAL TUSCAN DEAF AND DUMB ASYLUM.

Corso di pratico insegnamento per i sordo-muti italiani, del P. Tommaso Pendola delle scuole Pie.

Esercizii graduati di lettura per i sordo-muti, per Tommaso Pendola delle scuole Pie.

Sulla Educazione dei sordo-muti in Italia, Studi di Tommaso Pendola delle scuole Pie.

#### FROM THE PALERMO DEAF AND DUMB ASYLUM.

Grammatica per i sordo-muti di D. Ciro Marzullo.

Catechismi di scienze, lettere, arti per i sordo-muti di Ciro Marzullo.

Javelo dei segni dattilologici.

Saggio dato dai sordo-muti di Palermo.

#### FROM THE MODENA DEAF AND DUMB ASYLUM.

Una Guida all' insegnamento della lingua italiana di Geminiano Borsari.

## SECTION II.

### CHARITABLE AND EDUCATIONAL INSTITUTIONS.

#### § 1. CHARITABLE EDUCATIONAL INSTITUTIONS.

**2048.**—2349\*. MARINE ASYLUMS (COMMITTEE OF), *Via-reggio*.

Photographic plans and elevations of the Infants' Home at Viareggio.

Degli Ospizii Marini gratuiti per gli Scrofolosi indigenti, memoria letta alla Società medico fisica, fiorentina nell' Adunanza del 12 giugno 1853 da Giuseppe Barellai. Firenze, Le Monnier, 1853.

Rapporto della Commissione per la proposta degli Ospizii Marini, del Dott. C. Morelli.

Rapporto letto dal segretario del Consiglio dirigente la Società degli Ospizii Marini nell' adunanza pubblica tenuta nella Sala del Buon Umore, la mattina del giugno 1857.

Feeling deep compassion for the number of poor children who died of consumption at the hospital of Florence, Prof. Barellai conceived the noble idea of founding, near the sea, an establishment where the children of the poor might receive the benefit of baths and sea air, in the treatment of scrofulous diseases; and the result of a memoir which this philanthropist presented to the medico-physical society of Florence, and which he afterwards published, was the formation of a society for the establishment of the charity proposed by him. The society commenced its work in 1856, and last year 102 children, of whom some were maintained by the funds

of the society, others paying a slight contribution, were sent during the summer to Viareggio, a little town at the seaside, near Pietrasanta, Lucca and Pisa, placed in temporary premises, and confided to the zealous care of a peasant woman, Catarina Lenzi and of the Serviti monks, who have a convent in the town. The simple but well adapted building about to be erected, has been designed by M. Casamorata, a distinguished architect. The annual expense of the maintenance of each child has amounted to lire it. 57.35 (47s.), taking an average of 6 years. The administration displays admirable activity, and the respected founder, M. Barellai, directs the work upon a plan for which the necessary funds are alone required to render it permanent.

## 2049.—1793.\* INFANT ASYLUMS (SUPERINTENDANCE OF), *Florence.*

Photographs representing some of the rooms of the infant asylums at Florence.

Plan of the asylum of Santa Catarina.

Statuto organico della società, pel mantenimento degli asili infantili e delle scuole di mestieri di Firenze. Firenze, 1848.

Regolamento per la direzione interna degli asili infantili di Carità, di Firenze. Piatti, 1854.

The funds for the Children's Asylum come from private sources. A philanthropic society who elect a governor, presides over the administration of Asylums. A lady superintendent, with an assistant superintendent and some novices, attend to the school and the classes, and are subject to the surveillance of the lady instructress and the visiting inspectors. To MM. Lambruschini and Guicciardini, of Florence, and M. Lodovico Frassi of Pisa, the whole of Tuscany, and these two cities in particular, owe the Infant Asylums instituted since 1834, on the model of that founded at Cremona, by Aporti. Florence has four for boys and one for girls, which afford accommodation for 500 children. They are admitted at 3 years of age. The boys are kept till 9, and the girls till 12.

The asylum is divided into two classes. Reading, writing, arithmetic, the primary elements of geometry, sacred history, the catechism, &c., are taught. One day in the

week is set apart for religious instruction. The children reach school at 8 to 9 o'clock in the morning; the day commences with prayer. The dinner, which consists of meat soup, is followed by recreation, previous to the resumption of lessons; these continue till the time for leaving school, when the children eat whatever they may have brought with them in the morning, and go home accompanied by some trustworthy person of the family. Prayer, which begins the day, is also said before dinner, and precedes the departure in the evening. Between the lessons, walking and other exercise is permitted, and a portion of the day is set apart for singing hymns and songs.

It is very desirable that the rooms and passages should be larger, that a second and more substantial meal should be given during the day, and that the exercise and employments should be better adapted to develop the physical strength and intelligence of the children.

A committee of 112 physicians and surgeons attend to the care of the children's health; they act as visitors to the asylum, and a number of chemists supply medicines at cost price, and sometimes gratuitously.

Many recent improvements and extension of the benefits of the society are due to M. Cino Rossi, the present director.

## 2050.—ORPHAN ASYLUM OF LA PIETA, *Prato (Florence).*

Opened in 1857, for twelve orphans, by M. Gaetano Magnolfi, formerly a humble artisan, and now a merchant of great credit, this charity was transferred in 1828 to the suppressed convent of La Pietà, granted by the government. The charity is maintained by various contributions; by the *Pia casa dei Ceppi*; the hospital fund; the income arising from lands; from the interests payable by the treasury upon a capital of £18,033, which the Leghorn Railway Company has deposited for the benefit of the institution; from the interest of funds invested for the foundation of six gratuitous places by the same Company; the contributions of various boarders; and finally, funded property. In addition to the rooms necessary for the use of the pupils and their masters, the establishment has twelve shops, for tailoring, shoemaking, engraving, cabinet making, carpentering, chair making, printing, binding, and weaving, with an iron foundry and a silkworm nursery. The pupils receive lessons in reading, writing, arithmetic, Italian grammar, mathematical and ornamental drawing, and any professional

education they may choose, according to the resources of the establishment.

Children born at Prato or the neighbourhood, between the ages of 14 and 17, who have lost one or both their parents, are admissible to the asylum. They remain in the establishment until they have completed their eighteenth year.

The shops are given over to the possession of master workmen, who teach the children their trades, and have the occupation and the gratuitous work of the children in exchange for the care bestowed upon them.

On leaving the asylum, the orphans, to meet the expense of their first engagement, receive a small sum, accumulated through an annual gratuity during their stay in the charity, and which the administration pays in one sum, if the conduct of the pupil has been satisfactory; it is lessened by one-half if the child's character is not very good. The arrangement of the rooms and shops, and the quantity and quality of the food, are excellent.

A physician and a surgeon superintend the health of the convalescent in the orphan asylum, where only slight indispositions are attended to, disorders which last any length of time being treated in the town hospital.

A photographic plan shows the general arrangement of the building and its outhouses.

## 2051.—2232.\* WORKHOUSE, FLORENCE (*Pia Casa di Lavoro*).

Photographs of the ground floor, the first story, and the façade of the house.

Manuscript notices.

Statistics of the workhouse.

Administrative arrangements.

Collection of educational appliances.

The *Pia Casa di Lavoro*, founded in 1813 by the French government, and confirmed in 1815 by the government of the Grand Duke, was, in 1816, 1818, and 1819, modified in its interior arrangements. At present a radical reform is necessary in order to render justice to the complaints made by the citizens and petitioners, whose poverty claims every sympathy. The charity is open at present to individuals of all ages and sexes. Those who are under three years of age are entrusted to the hospital for foundlings; those who are above three years, and less than ten, are brought up in the orphan asylum of the *Bigallo*. The care of those children is not neglected, who, in consideration of a small monthly payment, are confided to the families

of artisans of known character. The number of these outboarders was 537, against 1246 admitted in 1861.

The establishment is subject to a director, assisted by a chief superintendent, of a clerk of the outgoings, of a master of works, and a visitor. A priest attends exclusively to the spiritual duties; medico-chirurgical attendants are appointed for the superintendence of the invalids and the infirm and all cases of accidents. Serious disorders are treated in the hospital of S. M. Nuova. Moral conduct, discipline, instruction, &c., of the inmates are regulated, assisted by a committee, composed of the mayor (Gonfaloniere), of the commissioner of the Orphanage of *Bigallo*, two government commissioners, and two distinguished citizens. Some patrons, of known respectability and influence, are permitted to assist in the deliberations of the board.

The board is divided into two sections, that of *surveillance*, which is exercised to promote the discipline and moral conduct of the family, and that distinguished as *industrial*, which attends to the work and the instruction of the individuals admitted.

The director confers with the board upon all important points.

The daily food and clothing are supplied by the establishment.

The inmates receive, three times a week, one hour's lesson in reading, writing, and arithmetic, according to the mutual instruction system; a priest instructs them in the catechism and the duties of religion.

The system of discipline consists in admonitions and various punishments, which may be carried as far as seclusion, during twelve months, in a discipline room; but the director who inflicts this punishment, in conformity with the regulations, is bound to give due explanations before the board.

All the inmates who are physically capable, must follow or learn some trade, either in the shops of the charity or under masters known for their honesty and skill.

Of the sums which the inmates receive for their work, whether in the shops of the establishment or in the shops out of doors, two-thirds are paid the charity, the remaining one-third remains their property; one moiety of this third is paid over to the inmates at the end of each week, and the other moiety is put out at interest until the time of his quitting the establishment, when the amount due weekly is paid over. Stoppages are deducted as a punishment for bad conduct, or for repair of clothes, or repairing of tools, &c.

The inmates are not assisted when the position of the family improves, or when they are sufficiently skilled in the exercise of a business to be able to earn 56 centimes if a man, or 42 centimes if a female. The superintendent of the works informs the directors when he deems it a proper time to discharge the pupil, and,

after notice given, he must prepare to leave the establishment in three months.

They are taught the most common and useful trades; the women, besides sewing and shoebinding, are taught washing, ironing, and cookery.

The Pia Casa has contained 1,300 persons within its walls. It receives a considerable vote of money from the municipal council; the government contributes a not less important sum to keep the building in repair; private persons make donations; and it has the profit of the manufactured articles sold.

Although everything within the building is regulated for the best, it would be desirable to have more space and ventilation, both as regards the building and the workshops.

## 2052.—2340. WORKHOUSE, LEGHORN (PIA CASA DI LAVORO DI ST. ANDREA).

General plan of the Pia Casa di Santa Andrea.

Views of the interior.

Regulations, specimens of printed forms, &c.

Statistical returns of the establishment.

This establishment, a part of which only is used as a workhouse, was begun in 1844, and opened on the 25th July, 1861.

The managers of this workhouse consist of a committee, composed of the mayor (*gonfaloniere*), a directing councillor, two respectable citizens, and one merchant, to which are added six manufacturers of Leghorn. There are also a manager, a sub-manager, secretary, chaplain, and medical attendant.

The inmates consist of two classes:—beggars brought there by the police, and persons whose families being destitute of the means of subsistence or of education, provided they have been five years at Leghorn, are not less than between seven and fifteen years of age, and bring certificates of destitution, it being required that they should be of

sound mind and free from infectious disorders. Besides this, persons are admitted as boarders upon payment of a small sum.

Minutes are kept of the admissions.

Every person admitted is supplied with a bed, marked with a general number, which is applied to everything he uses; and each one has a suitable and decent dress or uniform.

They are divided into two classes, those under and those above twelve years of age. The boys are kept until 18 years of age, and the girls till 20.

The food and the mode of passing the time are regulated according to the age and relative wants of the individuals.

After dinner, the pupils under 17 years of age receive lessons in reading, writing, and mathematical drawing, by a method of mutual instruction, the girls and the boys being taught on alternate days. On holidays, the interval between mass, breakfast, and dinner is passed in recreation; and, as a reward for good conduct during the week, the boarders have permission to go out of doors, in parties of 25 at most, and to take walks indicated by the manager.

Work is compulsory for all the boarders who are capable of it, and is carried on in the house by means of patrons and masters, and by the apprentices, who are entitled to two-thirds of the profits, one-third being put in the savings bank until they leave; the other third is handed to them at once.

The reward for good conduct consists in medals, with the inscription "*Perseveranza*," which are exhibited in some conspicuous place. Bad conduct is punished, at the discretion of the directors, by simple admonition or privation during a whole year of the privilege of walking out of doors, and seclusion in a cell during a discretionary period. If the above means are insufficient, the managers and the board take measures with the authorities to have the culprit confined in a house of correction.

From the 15th June to the 31st December, 1861, the internal expenses were £1,954 8s., each boarder costing on an average the sum of £1 16s. 4d. yearly.

Statistical tables and reports are made concerning the health, morals, and state of discipline of the whole establishment.

## SECTION III.

## COLLEGES AND BOARDING-SCHOOLS.

**2053.**—2340.\* **ROYAL CIOGNINI LYCEUM, Prato, Florence.**

Plans and elevation of the Cicognini.

Information and printed notices on the Cicognini college.

This public educational establishment, which has taken the name of its illustrious founder, is directed by secular priests, and receives a grant from the state. The management is confided to a rector, assisted by a vice-rector.

The scholars are admitted from 7 to 13. Their education embraces, writing, arithmetic, Latin, Italian, Greek, French, rhetoric, mathematics, philosophy, physical science, chronology, history, gymnastics, and declamation; they are free to learn besides, English, vocal and instrumental music, drawing, architecture, dancing, and fencing.

The studies are varied with recreation and gymnastic exercises.

There are large premises near Prato, in which six weeks in the year are spent.

In case of illness, the pupils are attended to in a large, well-ventilated infirmary.

The fee for boarders is 593 lire it. (£23 14s). Pupils not born in Tuscany must either be able to refer to a banker there, or be well known to the head master. On entering the Lyceum each pupil must have a complete outfit.

The importance of the Cicognini College may be easily conjectured on inspection of the two plans and the view accompanying the report. If the plan had been carried out fully, it would have been difficult to find an edifice better adapted to its purpose.

**2054.**—1792.\* **BOARDING SCHOOL, CONVENT OF THE SIGNORE DELLE QUIETE, Florence.**

Plan and elevation of the school attached to the convent.

Only young ladies of the nobility are admitted, from five to ten years of age, to re-

main there until they have completed their eighteenth year. The education given comprises Italian literature, ancient and modern history, sacred history, geography, arithmetic, English and French, drawing, music, and singing. Governesses supply the elementary education, with the exception of the catechism, which is taught by a priest. The board and education is from 740 lire it. (£30) without extras.

No books, letters, or newspapers are allowed to be received without special permission.

Parents who live in Florence may see their daughters twice a week; twice a year parents living elsewhere may see them daily during one week. The building was an ancient villa of the Medici, and has rather the appearance of a country seat than of a school, but as regards the site nothing could be better, as it is situated on a hill to the north of Florence, and furnished with all the comforts of life. There is a large garden, where the pupils may recreate mind and body. The food is much more liberally given than in other similar establishments in Florence.

Donna Eleonora Ramirez di Montalvo, whose venerable features have been recorded by Carlo Dolci's pencil, founded this educational establishment in 1645. In 1647, some ladies and twelve young girls assembled together, under the direction of Eleonora, in a house at Florence, where they remained but a short time, as they soon transferred their establishment to the place it now occupies.

**2055.**—2348\* **S. S. ANNUNZIATA (ROYAL INSTITUTION FOR GIRLS), Florence.**

Summary of the regulations and statistical notices of the Institution.

The institution of the Annunziata was founded in the early part of this century, for the instruction of the daughters of the middle classes. The cost of boarding is from 1120 lire it. (£45) yearly; the purses are from 560 livres. The education commences at seven and finishes at seventeen. The pupils are divided into three classes, being taught reading, writing, arithmetic, Italian

grammar, literature, history, geography, elements of physical science, French, drawing, dancing, vocal and instrumental music, needlework, and everything that can be useful to the mistress of a household, for which purpose the more advanced pupils have the privilege of assisting in keeping the house.

There are two officers nominated by the government, an inspectress, and a sub-inspectress, a lady accountant, house-keeper, nurse, and some teachers. A priest catechises the pupils, and a chaplain performs religious ceremonies.

In case of slight illness, the nurse is assisted by some of the pupils.

The parents receive monthly reports of the conduct of their children.

Near relations may see the pupils at stated times; friends are only received with the permission of the guardians or of the near relatives.

Baths and other sanitary measures are attended to.

As seen from without, the building does not give any idea of the purpose to which it is destined. The school rooms, the sleeping rooms, and the dining hall are of suitable dimensions.

## 2056.--2344.\* CONSERVATORIO DELLE MONTALVE, *Ripoli, Florence.*

Photographed plan and exterior of the school.

This school was founded by Leopold I., at

the close of the last century, for the daughters of the upper and middle classes, aged from 5 to 11 years. They remain in the school till they are 18, and are taught reading, writing, arithmetic, history, geography, drawing, the Italian and French languages, dancing, and domestic management. Accomplishments, painting, vocal and instrumental music (harp and piano), and English and German lessons are extras.

The pupils repeat their catechism and assemble for the performance of prayers several times a day. The boarding is £28, including medical attendance.

A large court yard separates the house from the public road. It is a fine building, and with some improvements, principally in the interior, the establishment would be very good.

The pupils are divided into three classes; the first from 5 to 11 years of age; the second from 11 to 15; the third from 15 to 18.

Visitors must be provided with a special permission, except parents, who may see their children upon fixed days; parents who do not live in Florence may see their daughters every day for a week, twice a year.

The pupils cannot receive letters, newspapers, or books, without permission.

They are forbidden to wear jewellery, &c.; the senior pupils, however, are allowed to have a silver watch.

Great attention is given to the food, lodging, clothing, and health.

None of the scholars can go out of the establishment during the term of their education, except to take sea-bathing, under the prescription of the doctor.

## SECTION IV.

### SCHOOLS AND COLLEGES.

## 2057.—1795.\* COMMUNAL SCHOOLS (FLORENCE).

Summary of the regulations and statistical notices.

The communal schools receive children of all grades under six years, on condition that they have been vaccinated, are in good health, and exempt from repulsive physical defects. They are taught reading,

writing, arithmetic, catechism, sacred history, and the rudiments of Italian.

The more advanced scholars receive lessons in geometrical drawing.

Relations or other persons, having authority over the children, can remove them, by giving a short notice to the inspector.

Each school is divided into two halls. In the first, a master teaches the children collectively; in the second, a master instructs them by following the method of mutual teaching.

Instruction is given in the catechism by a master, once a week.

An inspector, charged with surveying the schools, makes a return every month of holidays, absences, &c., and sends a report to the mayor (*gonfaloniere*), who transmits it to the deputies named by the municipal council, confirmed by the government, and charged with all that relates to schools.

## 2058.—2328.\* 2330.\* NORMAL SCHOOLS FOR GIRLS (SUPER-INTENDENCE OF), *Florence*.

Summary of the regulations and statistical notices of the four normal schools for girls in Florence.

Six photographs of S. Paolo school.

The Tuscan Government, at the end of the last century, founded schools at Florence, Sienna, and Pistoja, for teaching girls household management. In 1778, four schools on this plan were opened at Florence, but the original institution was modified in 1804, by the Regent of Etruria, who introduced a system so full of bigotry that instruction was nearly extinguished. Florence possesses four schools of this description, called S. Salvatore, the Mendicanti, San Paolo, S. Giorgio, and S. Caternai.

Girls, aged six and upwards, are taught reading, arithmetic, sewing, embroidery, weaving flax and silk, the catechism, and good behaviour. The number of scholars varies from 1,300 to 1,350, but unhappily it has been found necessary to turn away 600 others for want of room.

The parents receive the profit of the needlework performed by the children, but the produce of ordinary weaving and silk manufacture remains the property of the scholars, who, in addition, after having attended the school from 7 to 17 years of age, or continuously during eight years, receive a gratuity of £5 12s.

From the 1st April to the 1st October, the pupils come at 7 o'clock, and from the 1st October to the 1st April at 8 o'clock in the morning.

In going to and from school, the pupils are accompanied by some one belonging to, or selected by, the family. 21 pupil teachers, and as many under teachers, attend these schools, under the direction of a lay superintendant, whose labours are gratuitous.

The annual expense, including salaries, amounts to £1,069, of which £578 is furnished by the foundation; £446 by a grant from the municipality; £35 by a grant of the Bigallo Orphanage, for the instruction of the

orphans received in the schools; and £10 from special foundations.

These schools are entirely for the poorer classes; but, although they effect considerable good, there is much need of reform in the methods of elementary teaching, the construction of the working implements, and in providing spacious rooms, and other sanitary requisites.

## 2059.—2325. ROYAL LYCEUM AND MUNICIPAL GYMNASIUM, *Florence*.

Plan of the Lyceum, formerly Portinari palace.

Photograph of the principal court yard.

Books used in teaching.

The lyceums and gymnasiums of Tuscany are divided into two categories, according to their objects, either to teach the dead languages, or the living languages and the exact sciences; they have common studies and special studies.

Teaching in the gymnasium usually lasts five years, the boys being admitted at the age of 10. The study of Latin, for the scholars of the first category, lasts four years, and commences on the second year of the gymnasium, unless the scholar, having failed in his preliminary examination, is sent back to the elementary class of Italian grammar.

After having studied Italian during four years, the scholars of the second class undergo an examination, which gives them admission to the lectures of the lyceum, and ultimately to a diploma.

### COURSES OF THE GYMNASIUM.

1st year (for both classes). Italian; composition; arithmetic. The catechism is compulsory for Roman catholics in all the schools.

2nd year.—Italian grammar, composition, mnemonics, logic, cosmography, geography, Greek history, arithmetic. The first class are also taught Latin grammar, syntax, grammatical analysis; the second, French grammar.

3rd year.—Italian rhetoric and literature, geography, Roman history, arithmetic, and French grammar. The first class learn in addition, higher Latin grammar, logic, Latin classics, themes, Italian literature, and rhetoric.

4th year.—The scholars of the first class learn rhetoric, prosody, Greek grammar; those of the second, rhetoric; but they all study French, literary history of Italy, geography, and analytical arithmetic.

5th year.—Higher rhetoric, higher Greek grammar, Greek classics, French, arithmetic,

political, religious, and civil history, with geography.

#### COURSES OF THE LYCEUM.

This is divided into two years.

1st year.—Italian, Latin, Greek, and French literature, elementary philosophy, Italian history, plane geometry, elements of algebra, and physical science.

2nd year.—Italian, Latin, and Greek literature, philosophy, law, algebra, trigonometry, geometry, universal history, human anatomy, higher physical science, natural history, chemistry, *materia medica*, minor jurisprudence.

After this those classes intended to study theology, philosophy, and philology, prepare for the bachelorship, and study the Italian, Greek, and Latin literature, philosophy, and universal history.

The class of jurisprudence studies Italian, Latin, and Greek literature, Roman and national law, philosophy, and general history.

The class of medicine and surgery embraces Italian literature, philosophy, anatomy, higher physical science, and natural history.

The mathematical class includes Italian literature, philosophy, geometry, algebra, trigonometry, and higher physical science.

The class of the natural sciences—Italian literature, philosophy, algebra, trigonometry, geometry, higher physical science, natural history.

The class of agriculture—learns the same things, and goes through a course of agriculture in addition.

The class for veterinary medicine—Italian literature, philosophy, human anatomy, natural history, physical science.

The class of minor jurisprudence—common to those who are destined for notaries, for the municipal chancelleries, and for employment as petty magistrates, lasts two years. First and second year, Italian literature, elementary moral philosophy, Roman and Italian law, criminal law.

The class of pharmacy at the Lyceum goes through courses of theoretical studies in two years, following, in the 1st year, Italian literature, general and elementary philosophy, physical science, chemistry, and botany.

2nd year.—The same subjects, and *materia medica* in addition.

#### DIVISION OF THE LYCEUM.

The Lyceum, as a whole, is divided into two sections.

1st section of the Gymnasium.—Elementary Italian grammar, called higher Italian literature, 1st and 2nd year. Elementary and superior Latin grammar, elementary and superior rhetoric, Greek and French grammar,

history, geography, arithmetic, practical and theoretical, as far as the elements of algebra, gymnastics.

2nd section of the Lyceum—Italian, Latin, Greek, and French literature, elementary and superior; elementary philosophy, Roman and Italian law, criminal law, universal and Italian history, elementary and superior physical science, chemistry, natural history, *materia medica*, human anatomy.

Those who are charged with teaching at the gymnasium have the title of masters and teachers; the teachers at the Lyceum have the title of professors; the first are paid by the municipality, the second by the state.

There are special teachers for instructing the catechism, elementary Italian grammar, higher grammar and literature, higher and elementary Latin grammar, rhetoric, Greek and French grammar, history and geography, theoretical and practical arithmetic as far as the elements of algebra, and gymnastics.

The lyceums open each year on the 4th of November. The course of the gymnasial section lasts from the preliminary examination to the 15th August. Those of the lyceal section commence at the same time, and finish on the 30th June. The hours of the lessons, and other internal arrangements are fixed by regulation.

The schools of the lyceum and gymnasium of the Florentine municipality have been recently installed in the ancient palace Portinari-Salviati, which the municipality has purchased. This superb edifice possesses plain rooms for the classes, sleeping apartments, and a large court for gymnastic exercises, &c.

#### 2060.—2329.\* NORMAL ELEMENTARY SCHOOL (MAGISTRATES' SCHOOLS), Florence.

Summary of the regulations and statistical notices of the normal school.

Plans.

Books of the normal school, in the convent of the *PP. Serviti* of *Annunziata*.

The two normal schools were founded in 1859, one for male and the other for female teachers; and, thanks to Senator Lambruschini, M. Pietro Thouar, and Madame Amelia Paladini, they answer the purpose well. The course lasts three years, followed by a diploma, which is also accorded to those who, without having attended the normal school, have passed a satisfactory examination, or who, after having studied at home, pass a term of six months in the school, to study

an experimental course or take lessons in practical teaching.

The male teachers are admitted at 16, and the female teachers at 14.

The admission only takes place after satisfactory examinations in reading, writing, and the Italian language, arithmetic, and sacred history, and on a certificate setting forth the general respectability of the candidate and his family.

In the normal school of teachers are taught religion, morals, history, the Italian language and literature, geography, arithmetic, geometry, book-keeping, writing, outline drawing, the elements of physical science, and chemistry applied to the arts and manufactures, hygiene, military exercises, natural history, and singing.

From the opening in November, 1859, to February last, the normal school gave 360 certificates of competency. Government has given it 21 purses of 250 francs each.

The course for female teachers is composed of lessons in sewing, embroidery, reading, writing, arithmetic; catechism, history, sacred and universal, elements of Italian grammar,

letter writing, natural history, Italian design, sanitary rules, and domestic economy.

The course of study lasts two years; the teaching is divided into three classes. They have the privilege of remaining four years at the normal school, to perfect themselves in embroidery in linen, silk, and gold, and other branches of education.

The young ladies must be accompanied, both in going and returning, by persons in whom the families confide.

The normal school is open from nine in the morning till four in the afternoon.

The pupil-teachers of the normal school number 130; the children who attend the course of the experimental school number 150; the apprentice teachers instruct them in reading, writing, arithmetic, geometrical drawing, history, geography, and morals.

To this normal school, the directress, Madame Paladini, has lately added a Sunday school for workwomen, which numbers at present 60 scholars.

For the scholars of both sexes at the normal school, it is in contemplation soon to open a boarding school.

## SECTION V.

### UNIVERSITIES, MUSEUMS OF NATURAL HISTORY, TECHNICAL INSTITUTIONS.

#### 2061.—1787,2338\*. ROYAL UNIVERSITY OF PISA.

Plan of the Museum of Natural History and the Botanic Garden.

Photographic views of the above establishments.

Photograph of the interior of the University.

Photograph of the old observatory.

Photograph of the normal school.

At the end of the 12th century the study of Roman law flourished at Pisa. The popes recognized the importance of the school of Pisa in the 14th century. Lorenzo de Medici and the Grand-Duke Cosmo I. gave their patronage to the University. In 1830 it was largely increased, on the propositions made by M. Giorgini, their superintendent. There are six faculties: theology; philosophy and philology; law; medicine and surgery; mathematical sciences; and natural sciences. There are 50 professors, 14 assistant professors, 1 anatomical demonstrator, 4 messengers, 2 assistant messengers, and 2 helpers. An

annual sum of £10,851 is devoted to the academic staff.

The university possesses a library, and a museum of natural history, divided into the cabinets of zoology and zootomy, mineralogy, and geology.

A botanic garden.

A veterinary and agricultural school.

A cabinet of agricultural chemistry.

" physiology.

" experimental physical science.

" physical science, technological and descriptive.

" general chemistry.

" veterinary anatomy.

" general anatomy.

The university is under the superintendence of a rector and the academic council, composed of six deans and representatives nominated by each faculty.

Various colleges had been formerly founded in favour of necessitous young men frequenting the University. The college della Sapienza, founded for 40 young men, by Cosmo I. de Medici; the Ferdinando college, founded by Ferdinand I.; that of Ricci, founded by Cardinal Giovanni Ricci di

Monte Pulciano, Archbishop of Pisa, in favour of eight of his young countrymen; the Puteano College, founded in 1606, by the Archbishop Charles Antoine del Pozzo, of the Cisterna family, who instituted seven purses in favour of his townsmen. All these colleges, with the exception of the first, have been suppressed, and the purses retained.

Since the last reforms there has been added to the University of Pisa a normal school for preparing bachelors for the course of secondary teaching. This normal school has been opened in the Palace *dei Cavalieri carovanzisti di Santo Stefano*, built by Vasari, who modernised the edifice which Niccolò Pisano had designed to serve as the residence of the ancients of the republic.

The normal school (the only one on this principle existing in the kingdom) was instituted by royal decree of the 28th of November, 1846, and is presided over by the rector of the University, by a special rector, and by a director of studies. These professors deliver courses of philology, philosophy, and the mathematical and natural sciences.

In 1734, the architect, Giulio Foggini erected an observatory, which was provided with instruments of the greatest masters of the time, and it numbered among its professors and directors Perelli, Slop, and Piazzini. But in 1829, during the lifetime of Piazzini, the building for the observatory was unhappily pulled down, from a foolish fear that it had gone to decay.

The Botanic Garden of Pisa is the most ancient in Italy, and was formed but a short time before that of Florence called *Giardino dei Semplici*. Formed in 1252, by Cosmo I., it preceded by two years that of Padua, and by twenty-four years that of Bologna. The site was removed to its present locality by Ferdinand I., in 1594, and it has increased lately under the direction of M. Pietro Savi.

The museum of natural history has recently been considerably developed, under the direction of M. Paolo Savi, the eldest son of the celebrated botanist Gaetano Savi, and by M. Meneghini, who succeeded M. Pilla in the chair of mineralogy, that esteemed professor having lost his life on the plain of Curtatone, in 1848, while struggling for the independence of Italy.

(See No. 2036).

## 2062.—1786, 2336.\* P A V I A (ROYAL UNIVERSITY OF).

(See No. 2017, 2037.)

## 2063.—1783. ROYAL NATURAL HISTORY MUSEUM, Flo- rence.

Photographs of the tribune of Galileo, the fossil and bird rooms, and the herbarium.

(See for other photographs and articles exhibited, No. 2035.)

The history of the Royal Museum of Florence is intimately connected with the memory of Galileo and the select group of his pupils who inherited from him the spirit of observation, and that philosophy which produced a complete revolution in science.

The Academy of Cimento, warmly patronised by the Medicis, who were among its members, having soon ceased its operations, all its documents, as well as a very large number of objects of natural history, were conveyed to the Medicis palace, and were inherited afterwards by the grand dukes of the house of Lorraine and Augsburg. Pietro Leopoldo greatly increased them, and assigned a special locality for their reception, to which he added a botanical garden and an astronomical observatory; he enlarged the library, and ordered that this establishment should be specially devoted to the study of the physical and natural sciences. But it was reserved for the kingdom of Etruria to carry out this scheme, and to open at Florence a public school of science. In 1807 the courses were inaugurated, and the museum became the object of great interest, which elevated this establishment to the most distinguished rank. Public feeling having become more tranquil after the restoration, the grand dukes made new additions; the last grand duke of Tuscany founded the Central Herbarium, the erection of the Galileo tribune, and many improvements. The late government gave it the constitution which it has at present, and divided the collections as following:—

- A cabinet of physical science.
- A laboratory of chemistry.
- An astronomical observatory.
- A meteorological observatory.
- A cabinet of geology and mineralogy.
- A cabinet of vertebrate zoology.
- A cabinet of invertebrate zoology.
- A botanical cabinet and garden.

Two new chairs were also added, one for teaching mining engineering, and a chair of chemistry.

With respect to these divisions, the physical cabinet already existing, and rendered illustrious by the name of Nobili, contains very valuable objects connected with the history of science, and especially those which belonged to the Academy of Cimento, and to Galileo. Numerous scientific apparatus have been recently added, amongst which those for electricity up to the time of Nobili. The chair of physical science being lately restored,

it is intended to transfer M. Govi to the University of Turin.

The astronomical observatory founded by Devecchi, was presided over by M. Amici, and it is at present by Professor Donati, to whom we owe the discovery of the comet of 1861, named after him, as also many works on fixed stars and solar eclipses.

Ferdinand II. of Medicis, was the first who applied the barometer to the study of meteorology, and founded observatories in Tuscany and elsewhere. At his death, which took place in 1670, the observations were partially suspended till 1807, since which period they have been regularly taken up to the present time. At the third Italian Scientific Congress it was resolved to put in execution the project conceived by M. V. Antinori, for the creation of central meteorological records, a project which received the approbation of the Académie des Sciences of Paris, to which it was presented in the name of M. Antinori, by the joint professor, M. C. Puliti.

The geological collections of Florence are, like most others, as ancient as the museum itself, and it is very difficult to trace their origin. Stenone and Ferdinand II. made a collection for it similar to that which Ferdinand's father had given to Pisa University. The objects collected by Micheli, by Targioni, by Raddi, and other celebrities, were united to those which had been accumulated by Stenone and others, by the care of Professor Nesi.

The geological cabinet embraces three important sections:—

1. The mineralogical cabinet, rich in specimens, unique for their beauty and value.
2. That of geology.
3. That of palæontology.

This museum, by a decree of the government, will become the centre of a collection of Italian geology, according to the desire of the Italian savants assembled in congress.

Amongst the remarkable objects of this cabinet are the fossil remains of a hundred species of mammalia, many entire skeletons, and almost unique species.

The fourteen photographic drawings exhibited (No. 2035) represent, if not the most important specimens, at least those which are the most appropriate for this kind of reproduction, and suffice to give a favourable idea of this collection, one of the most remarkable in Europe.

This department has exhibited in the first class a collection of technical Italian geology, collected by M. Cocchi, who also exhibits his fine collection from la Spezia.

The department of zoology formed by the old collections of Gualtieri, Rumphius, Rediez, is divided into two cabinets, that of vertebrata, confided to the care of M. G. Mazzi, and that

of invertebrata, directed by M. A. Targioni Tozzetti.

The aggregate number of specimens in each branch, and especially in the classes of mammalia, birds, and mollusca, has been recently much increased.

It has very rich specimens, many duplicates, and a quantity of prepared objects of great value.

To this cabinet are added a dissecting laboratory, and workshops for the preparation of wax anatomical models, of which the most remarkable are due to L. Cigoli and to Zumbo, a Sicilian, who carried this art to a high degree of perfection.

When Pietro Leopoldo had founded the museum, Felice Fontano turned his attention to the execution of anatomical preparations in wax, and Clemente Sodini, Ferrini, Francesco Calenzuoli, Luigi Calamai, preceded M. Lusini and M. Tortoli, who is at the present time engaged on them, enriching the museum with an unique series of wax reproductions, executed under the direction of the professors and the most distinguished anatomists. Some specimens may be seen under No. 2035.

Botany is represented in the Museum of Florence, by the Garden, the Central Italian Herbarium, Webb's Herbarium and Library, by the old Herbaria, a collection of fossil plants and another of products used in manufactures.

For a long time the Botanical garden contained scarcely 800 species of plants, for the most part common, with a few valuable specimens brought from the Brazils, by M. Raddi. In 1842, Professor Parlato was appointed to the superintendence of the garden, which since that time has increased its contents to nearly 11,000 species, and doubled its extent.

The Central Italian Herbarium was founded in 1841, upon the suggestion made by M. Parlato at the third congress of learned Italians. It embraces nearly all the plants known in every part of the world, amounting to from 100,000 to 110,000 species, each of which is represented on an average by thirty specimens, and often by fifty or sixty; and but seldom by one or two only.

The two packages sent to the Exhibition (see No. 2025) are sufficient to enable a judgment to be formed of the order which has prevailed in the arrangement of this herbarium. Each package is enclosed between two millboards, fastened by a leather band with a buckle, thereby allowing the mill board to be easily opened. In the front of each package three tickets are attached, two of which are of parchment; one is on the right, and bears the name of the families, the second is in the middle, with the name of the species, and the third designates the variety of the plant. Each plant has been steeped in a solution of corrosive sublimate, to preserve it from the

attacks of insects. It is fastened, by means of a slip of paper, to the original ticket of the botanist who has sent it, whose name is inscribed on the ticket itself, together with the number and year of the entry of the plant in the herbarium. By this means reference can always be made to the origin of the plant and the value it derives from the above-mentioned circumstances. The ticket which is attached to the plant is fastened by two pins to a fly-sheets. All the half-sheets to which the plants are attached, coming from botanists and various places, are enclosed in an entire sheet, on the right-hand corner of which a ticket is fastened, with the name and synonyms of the species. By this means the plant required is immediately found, without disturbing any of the others. The specimens of the same species are afterwards distributed in geographical order, from north to south, first those of Europe, and then successively those of Asia, Africa, America, and Australasia, so as to indicate at once the geographical regions of each species.

The two packages sent as specimens of the Italian Central Herbarium contain the genus *Luzula*, selected on account of its extreme rarity, its being least liable to damage, and for having been collected for the most part by Prof. Parlatore during his travels in Russia and Lapland. Each species of this plant is represented by specimens from all parts of the globe.

The Webb Herbarium and Library were the liberal legacy of Mr. Philip Barker Webb, a distinguished traveller and botanist. This magnificent Herbarium contains about 80,000 species of plants and the valuable collection of Labillardière Desfontaines, Ruiz, Pavon, &c., besides several other collections, which Webb had purchased of botanical travellers, especially an Herbarium from the Canary Islands, the Flora of which he himself published, in his important work entitled "The Natural History of the Canary Islands;" an Herbarium of Madeira, the Azores, the Cape de Verd Islands, Morocco, &c.

The Webb Library contains about 5,000 volumes of botanical works, and is one of the richest of the kind; it contains the most costly works, a remarkable collection of pamphlets, periodical works, &c. Webb also bequeathed an annuity to increase these collections.

Among the ancient Herbaria is that of Cislipini, in three large volumes, recently illustrated by M. Théodore Caruel, assistant to the Professor of Botany; a selection of plants made by Linnaeus and his Swedish pupils; that of Micheli, whose manuscripts, in 66 volumes, are also preserved, of which

M. Adolfo Targioni Tozzetti has recently published a review in his edition of the Biography of Micheli by Giovanni Targioni Tozzetti.

The collection of vegetable products used in manufactures contains 20,000 specimens. The raw materials are represented by an immense variety of articles, such as woods, barks, textile fibres, gums, resins, wax, vegetable butter, feculae, sugar, natural flowers and fruits, or their imitations in wax, seeds, &c. The products are represented by a multitude of articles from all parts of the world, such as cloths, baskets, matting, rope, hats, candles, varnishes, pins, bracelets, cabinet work, macaroni, liqueurs, &c. Remarkably large trees or particularly rare plants are represented by photographs. This collection was commenced by Prof. Parlatore; in 1842, has been constantly augmented by what he brought back in his travels to the north of Europe, and by specimens received from all parts of the globe, and has just been placed in a large hall, built expressly in the museum to receive it. All the manufactured products are arranged with the plants from which they are made, and which are all classified according to the natural system, beginning with the seaweeds.

## 2084.—1783 bis. TECHNICAL INSTITUTE (*Istituto Tecnico*), Florence.

Photographic view of the School of Chemistry, and of different parts of the interior.

Collections of minerals.

This institution was founded in Florence, in 1846, and is an extension of an older one dating from 1810, attached to the Academy of Fine Arts. M. Filippo Corridi has added a workshop for apprentices, a museum of raw materials used in manufactures, manufactured products, machines, models, &c. Lectures and elementary courses are given by separate professors, on physics, chemistry, natural history, geometry, drawing, mechanics, and agriculture.

The studies may be either chemistry and physics or chemistry and mechanics. The period of study is three years, when a diploma is given.

The institution has been enlarged twice under its present Director, M. Amici.

## 2084 bis.—VETERINARY COLLEGE. Parma.

(See No. 2032.)

## SECTION VI.

## PUBLIC LIBRARIES AND ARCHIVES.

## § 1. PUBLIC LIBRARIES.

**2065.—2342.\* CLASSENSE LIBRARY, *Ravenna*.**

La biblioteca classense illustrata ne' principali suoi codici, e nelle più pregevoli sue edizioni del secolo XV., del Conte Alessandro Cappi. Rimini, 1847, 8vo.

Plan, section, and elevation of the library, designed by Prof. D'Alpino, of the Academy of Fine Arts, at Ravenna.

This library was founded in 1714, by Pietro Cameti, abbot of the Camaldules, in the now suppressed convent of S. Rainaldo, known as *Classe di Dentro*, whence its name. Cameti enjoys some reputation for his literary works, among which is his commentary on Frezzi's *Quadriregio*.

The library of Ravenna was considerably enriched in 1804, by the books brought from the suppressed convents. It has now 40,000 printed volumes, a large number of which are of the 15th century. Its most valuable work is a manuscript of Aristophanes, of the 9th century, which was edited by Becker. The present librarian, Count Alessandro Cappi, has published a catalogue, which is exhibited; he is also the author of a work on the paintings of Luca Longhi.

**2066.—2334.\* MALATESTIAN LIBRARY, *Cesena*.**

Photographic elevation and certain details of the Library.

In 1452, Malatesta, son of the lord of Cesena, built this library from the designs of Matteo Nuti da Fano, an architect of some note.

The chief object of importance in the library are the manuscripts, of which Guiseppe Maria Maccio had a catalogue printed between 1780 and 1784.

**2067.—1770.\* — ROYAL MAGLIABECHIAN LIBRARY, *Florence*.**

Photograph representing the interior of the Magliabechian library.

This library owes its name to the celebrated Antonio Magliabechi, who died in 1714. It was opened to the public in 1747, during the reign of Francesco I. Francesco Manni enlarged it considerably in 1731. Pietro Leopoldo added to it the Mediceo-Laurentian Library, and also a portion of the libraries of Strozzi and Gaddi, some part of which has passed to other libraries. The suppression of the convents brought new accessions to the Magliabechian Library, and the government made some purchases for it, amongst others that of some houses in the neighbourhood, which were required to obtain space for the collections now brought together.

Notwithstanding the efforts made by a great number of men, celebrated in both science and literature, who have succeeded each other as librarians, complaints still continue of the want of complete catalogues of manuscripts and printed books.

The library is now much behind in respect of new works, which is not surprising when it is known that in its limited government appropriation, the sum allotted for the purchase of books is £122, and for book-binding expenses £68. A sum of £714 is devoted to salaries, namely, that of a librarian and sub-librarian, two assistants, a clerk, and seven keepers and attendants. Several plans have been suggested either to enlarge the Magliabechian Library where it is at present, or to remove it. The idea has been thrown out to suppress all the other libraries in Florence, with the exception of the Laurentian, and to unite them altogether in one single National Library.

During the last Tuscan government, M. Ridolfi, Minister of Public Instruction, gave orders to the architect, M. Francesco Mazzei, to prepare a design which would at once meet the requirements of the public and the exigencies of the Treasury, and which would bring about a new scheme of administration in the libraries of Florence.

**2068.—2326.\* FLORENCE ROYAL MARUCELLIAN LIBRARY.**

Photographs representing the exterior and the reading room.

Francesco Marucelli, a Florentine, and Roman Prelate, at his death, at Rome, ordered all his books to be sent to Florence.

With these and the valuable funds that he left, he desired that a public library should be founded, endowed with a certain income, and made accessible to all literary men, and especially to poor necessitous young men.

Monsieur Alessandro Marucelli carried out the wishes of his uncle, and in 1752 opened to the public the library built after the design of Alessandro Dori, by Innocenzo Giovannozzi. The two drawings exhibited show us the external façade and the principal hall.

It contains 60,000 volumes and also some manuscripts. One of its most precious items is a collection of 170 printed folio volumes by classical authors.

It is open every day, not being a holiday, from 9 in the morning till 3 in the afternoon. There are a librarian, a sub-librarian, an assistant, a helper, a housekeeper, and an under housekeeper, the stipends of whom amount altogether to £400. The Government allows £213 10s. to the library, £160 of which is for the purchase of books.

## 2069.—FLORENCE PALATINE LIBRARY.

I manoscritti palatini di Firenze ordinati ed esposti da Francesco Palermo. Cellini Firenze.

Classazione dei libri a stampa della biblioteca palatina ecc. per Francesco Palermo, ecc.

Opera a ben vivere di S. Antonino arcivescovo di Firenze edita per Francesco Palermo, ecc.

The Palatine Library is in the Pitti Palace, and owes its origin to the Grand Duke Ferdinand III. M. Pietro Thouar has given an idea of the importance of this library in a guide to Florence (*Notizie e Guida di Firenze e dei suoi contorni Firenze* 1841), which he distributed to the scientific men who were present at the third scientific Italian Congress. The Palatine Library contained, in 1841, 70,000 volumes, together with a great number of ancient and modern editions of maps, drawings, and 1,600 manuscripts, not including autographs of many learned men, both Italian and foreign.

M. Francesco Palermo, appointed in 1849 keeper of the Palatine Library, published, upon the treasures confided to his care, those works in his name under the title of Cellini, Class XXVIII.

The staff of the Palatine library consists of a librarian, a copyist, a housekeeper, and two assistants, receiving altogether £321 yearly. Its annual appropriation for new purchases amounts to £643, £557 of which is for the

purchase of printed books, and the rest for binding.

## 2070.—2335. FLORENCE LIBRARY OF SAINT MARK DOMINICAN FRIARS.

Photograph of the Library of Saint Mark.

The Elder Cosmo de' Medici gave orders for this library to be erected by Michelozzo Michelozzi, a Florentine sculptor and architect, in 1444, and deposited there 400 volumes of Niccolò Nicoli, several volumes having belonged to Filippo Peruzzi, and others to Coluccio Salutati. That edifice having been destroyed by the earthquake of 1453, Cosmo had the vast hall rebuilt on a more magnificent plan than the first, and capable of containing all the Greek, Indian, Arabic, Hebrew, and Chaldaic books. Thanks to distinguished patronage, and the care of the Dominican Friars, this library has become so rich in manuscripts and printed books, that at the time of the suppression of the regular orders, it was considered one of the most splendid in Italy. At the present time it contains only about fifteen to sixteen thousand volumes and a small number of manuscripts.

## 2071.—1794.\* FLORENCE MEDICEO - LAURENTIAN LIBRARY.

Photographs representing various parts of the building, as well as the book-cases, and a double plan for its enlargement, by M. Pocci-anti.

This library contains the manuscripts of the classical Greek and Latin writers, which were collected in the fifteenth century, by the Elder Cosmo de' Medici, his son Pietro, and Lorenzo the Magnificent. After having been taken to Rome on the death of the latter, by Cardinal Giovanni de' Medici (Leo X.), and sent back to Florence by Clement VII., they were placed in the superb edifice designed by Michaelangelo, and built by Vassari, which they at present occupy. Amongst the collections which afterwards enriched the Laurentian Library may be enumerated those of the Gaddiana Library, that of Senator Carlo Strozzi, the Oriental Manuscripts described by Monsignor Evodio Assemani, the Biscioni Library, and the first editions of Greek and Latin authors collected by D'Elci, the original manuscripts of Francesco Redi, those of Vittorio Alfieri, and lastly those of Giovanni

Battista Niccolini, which he has bequeathed to his country as a last testimony of his patriotic devotion.

Assemani published a catalogue of Oriental works; that of Hebrew and Rabinal works appeared in 1752; Biscioni arranged the Latin, Greek, and Italian works in eleven volumes folio, which appeared from 1763 to 1793. Angelo Maria Bandini was not less useful to this famous library; and Professor Francesco del Furia, the successor of Bandini, arranged the books which came from the suppressed convents, of which three large manuscripts, the continuation of the catalogue drawn up by him, have not yet been published.

With respect to the seven photographs, the first shows the entrance hall of the library; the second, the library itself; the third, the gallery for d'Elci's edition; the fourth, a side view of one of the radiating avenues destined for keeping the books; the fifth, a *fac-simile* of the precious *Tempiano*, volume of Dante's *Divina Commedia*, and the two last a magnificent design of the celebrated architect, Pasquale Poccianti, for enlarging the library. The Mediceo Laurentian Library is, with the exception of October, open to the public during the entire year, from nine in the morning until three in the afternoon. It has a librarian, a sub-librarian, an assistant-librarian, a demonstrator, a house-keeper, and a servant, whose moderate stipends only amount collectively to £290.

## 2072.—1793 *bis*. LIBRARY OF THE ROYAL GALLERIE OF THE UFFIZI, *Florence*.

Musei etrusci quod Gregorius XVI P.M. in aed. vaticanis constituit monumenta &c. Ex aed vaticanis, 1843.

Righetti Pietro. Descrizione del Campidoglio. Roma, 1843, with engraved plates in outline.

Cappi Alessandro. Luca Longhi illustrato 475 copies, with engraved plates on copper and steel. Ravenna, 1853.

### § 2. ARCHIVES.

## 2073.—1798.\* CENTRAL ARCHIVES OF THE TUSCAN PROVINCES (SUPERINTENDENCE OF), *Florence*.

1. Plan of the part of the palace of the Uffizi at Florence, which contains the Central Archives of the State, ground-floor.
2. Plan of the building, *entresol*.
3. Plan of the first-floor.
4. View taken from the *Lung' Arno*.
5. View taken from the *Piazza della Signoria*.
6. View of the new staircase, built in 1856, forming a continuation of the Magliabecchian library.
7. View of the first hall of the official archives, where the most ancient documents are preserved.
8. Interior view of a large part of the building where the official archives are preserved, those of the Florentine Republic and of the Medici Government.
9. View of the seven rooms parallel with the Medici Record offices, in which are preserved the archives of the duchy of Urbino, and many others of the Medicis and Lorraine dynasties.
10. View of a part of the lower portion of this Record office, which belonged to the Medicis theatre, devoted since 1854 to the documents of the corporation of Arts in Florence.
11. View of a part of the upper portion of the Record office.
12. View of a portion of the former theatre of the Medicis, taken in 1854, before being devoted to the Record of judicial acts.
13. View taken in October, 1854, of the upper portion of the former theatre, then used as a map repository.
14. View of the portion of the room level with the ground, in which are deposited the documents brought from the Tuscan convents suppressed in 1810.
15. Plan of the Guidiccioni palace at Lucca, where are deposited the records of the State and the notarial acts.
16. View of the above.

17. View of the range of rooms on the first floor of the above, taken from the front.
18. View of the range of rooms on the first floor, taken from the back.
19. Plan of the State Record office at Sienna, situated on the third and fourth floor of the old palace, at present the prefecture.
20. View of the above, taken from the so-called Pope's Arcade.
21. Geometric plan of the first story of the former *Uffizio dei Fossi* at Pisa, built on the lodge called *Di Banchi*, with the plan of another building in front of the town hall, destined to contain the provincial records.
22. Geometrical plan of the second story of the two above-mentioned, and of the second story of the Gambacorte palace, also destined to contain records.
23. View of a portion of the arcade called *Di Banchi* at Pisa, and of the upper story of the *Uffizio dei Fossi*, and one of the façade of the former palace Gambacorte.
24. Plates of the 1st and 2nd saloon, above the arcades of *Or St. Michele*, where the contracts and protocols are preserved.
25. External view of the arcade of *Or San Michele*.
26. Internal view of the first Record room containing the contracts.
27. Internal view of the second Record room containing the contracts.
28. View of the arcades in the *Mercato nuovo* at Florence, in the upper part of which original notarial acts are deposited.

A commission, of which Professor M. Francesco Bonaini, of the University of Pisa, was appointed member, was instituted by the Grand Duke of Tuscany, in 1852, in order to arrange under one roof the collection of the different records which are at present dispersed in various establishments, aided by a staff strictly necessary for this great work, and to lay down such rules as would best ensure the safe custody of the documents, and make them accessible for historical researches, and finally, to prevent any abuses to the detriment of the state or private individuals.

The commission lay down as a principle that the records of Florence ought to be deposited in the libraries, and placed at the disposition of the lovers of historical science, and that with this object in view they ought to be provided with lists and catalogues for the use of students, and for the better preservation of the documents.

The palace of the *Uffizi*, built by Giorgio Vasari, was pointed out as a very convenient situation. It already contained the gallery of pictures, and communicated with the Magliabecchian Library; this having been acceded to, the architectural part of the undertaking was confided to M. Francesco Mazzei, under the chief direction of M. Alessandro Manetti, and M. Bonaini, with sixteen carefully selected assistants, set to work to classify the documents, and in June, 1855, the records of the state were opened to the public.

Following the track of history in the new disposition of the central records, two sections have been agreed upon; the first is formed of the official records arranged by Pietro Leopoldo, and containing very ancient documents, both public and private, also those relating to the acts, the suppressed monasteries, the municipalities, and charitable institutions; and the second of the archives of the Florentine republic, divided into three sections—political government, municipal government, and magistracy. This second section contains the papers of the Tuscan government under the regime of the Mediceis, the records of the principalities of Urbino and Piombino; the records of the government of the house of Lorraine, and those of the most important administrative acts of the country, from 1580 down to the establishment of the French authority.

The Grand Duke Pietro Leopoldo first founded the office of official records, with a view to collect the documents relating to the suppressed monasteries, the municipalities, charitable institutions, and public administration, and, in short, those of private individuals who might wish to place them there.

In 1855 the collection was composed of 130,000 parchments or documents, from about 350 different places. Now there are more than 141,000, as it has acquired from government the collection of Senator Carlo Strozzi, a celebrated scientific man of the 17th century.

The most ancient official document of Florence is dated Sept. 20th, 716, and the latest April 2nd, 1813. These contain, among other documents, four papers, already printed, the oldest of which dates from the 6th century, and several wax tablets of the 15th century, upon which the treasurers of Philippe le Bel, King of France, and numerous Florentine merchants, made their accounts. These were formerly preserved in the gallery of the *Uffizi*, and had been the

subject of some publications by Antonio Cocchi, and by the advocate Marco Tabarini. The present administration has lately completed the purchase of a rare collection of alchemical recipes in Italian, written during the 14th or 15th centuries, on plates of lead.

It was important that the diplomatical collection should not be touched, for which reason it has been preserved intact while being transferred to the office of the central records.

Plate 7th shows in what way the official documents are arranged in the shelves, according to their chronological order. The dates and particulars of their origin are written upon the back of each document. They are repeated upon a parchment ticket appended to one of the ends.

The official keeper of the archives at Florence has already rendered inestimable services to learning, as the works of Muratori, the Annaliste, Camaldulenses Brunetti, and Repetti, fully demonstrate. The first classifier of the official acts was the librarian, Ferdinando Fossi, known for his catalogue of documents of the fourth century.

As regards the catalogues, the first is strictly chronological; it simply gives the date, the origin, and the nature of the document; no document is put in its place without its being previously entered in this Catalogue.

For each locality there is an index, giving an abstract of all the papers and the names of the notaries or public writers who have committed them to writing. The names of all the notaries are afterwards entered in a special list, which, besides having the advantage of facilitating researches, furnishes also the means of comparison for purposes of authentication.

The work *Il Regio Archivio Centrale*, pp. 18 to 15, gives an account of the divisions adopted for the classification of the Medicean documents, as well as the neglected state in which the documents placed in an upper story were lying.

The superintending authorities having proposed to make out lists and complete catalogues, already far advanced in their preparation, a model of the last and provisional catalogue of the chapters of the commune of Florence has been exhibited.

The printing has been executed at the expense of the state.

After a systematization of the records of Florence, it was resolved that the two offices of the records at Lucca and Sienna should form two divisions of that of Florence, and in this manner, without removing the documents from the towns where they are most interesting, the different sources of the history of Tuscany have been collected together.

As regards the Record office at Lucca, M. Girolamo Tommasi had taken measures for its regulation in conformity with what existed

in the time of the Republic; but it was necessary to deposit the documents in some convenient place, and this the new administration has accomplished by transferring the records from the monastery of the Dominicans of S. Romano, to the former palace Guidicioni.

The records of Sienna have been nearly classified simultaneously with those of Lucca. Being increased by all the documents taken from the communal library, the papers of the university and the notarial acts, they have been transferred from the Town Hall, which formerly belonged to Piccolomini, to the Government Palace.

It was afterwards wished to remedy an old injury made against the city of Pisa, by its former conquerors; and by a decree issued the 22nd February, 1860, the Tuscan Government determined that Pisa, celebrated for its monuments and its traditions, and the seat of an important university, should not, any more than Lucca or Sienna, be deprived of her archives, and that the documents carried off by the Florentines should be restored to them.

The place destined to receive these records, which are now being placed in order, has been chosen in two contiguous houses, but built at different periods (see pl. 21 and 23). One portion of the documents will be deposited in a building constructed for the administration, above the arcades *Di Banchi*, built in 1605 by Bernardo Buon-talenti, by order of Ferdinando de' Medici. The other portion will be placed in the palace which belonged to Pietro Gambacorti, which is being restored.

It results, therefore, from what we have stated, that the records are deposited in edifices remarkable for their respective historical or artistic importance, thus following a good old practice of our forefathers. As an illustration, we shall only refer to the Florentine Record Office for Contracts, or, rather, of the Notarial Acts of 1659, which Cosmo founded with so much foresight, by assigning for it the splendid edifice *Or San Michele*, where papers of the highest importance have been deposited, reaching up to the year 1200.

The Record Office of the Minutes of Contracts is above the arcades of *Mercato Nuovo*, built by Bernardo Tasso. (See Plate 28th.) This institution, which goes as far back as Cosmo I., is the more remarkable, that in many of the Italian provinces the notarial documents have remained in the hands of private individuals, or have been deposited in the insignificant municipal archives, where consequently they are but too often neglected.

An act of the 14th December, 1853, the provisions of which were extended to the records of Pisa, Lucca, and Sienna, laid down the rules to be followed in the examination of documents, which are placed in a room

presided over by one of the keepers of records. A journal was also established, *Giornale Storico degli Archivi Toscani*, under the management of the general superintendent, and kept up by the gratuitous contributions of the assistants in the office, for the insertion of documents, brief monographs, and communications, which came from every quarter. This journal is in concert with the *Archivio Storico Italiano* of M. Vieusseux, who has undertaken the printing at his own expense, the government having agreed to purchase seventy-five copies of each number.

After all there was an urgent necessity to create in Tuscany an establishment to teach diplomatic paleography, and this was done in the most unostentatious way, by founding the *Scuola di Diplomatica e di paleografia*, which shortly afterwards was made public, and its professor received the title of Professor of the Florentine Institute (*Istituto Fiorentino di perfezionamento*). It is a three years' course, and there are three examinations. The pupils who have obtained their diplomas, and who, by a majority of votes, have been pronounced qualified to fill the duties of record keepers, remain attached to the service of the central Record Office, as supernumeraries, with an allowance of £14 13s. per annum, until they receive some permanent employment.

Count Mamiani, Minister of Public Instruction, appointed the Superintendent Professor Francesco Bonaini, to visit the Emilia, and make a report to the government respecting the probable expense, and the proper course to pursue to place the records of that part of Italy upon a level with those of Florence. The result of this mission was a proposal to establish a Record Office at Bologna, a scheme which has been advocated with all the documents in its favour, in a book published at Florence, in 1861, by Professor Bonaini, under the title of *Studi sugli archivi delle provincie del l'Emilia al finire del 1860*. This book, with the others above mentioned, has been sent to the Exhibition of London.

The Central Record Office at Florence, the seat of the general superintendence, and of the "*Scuola di Diplomatica*," have a staff of 23 officers and keepers. The Record Office

at Lucca has seven, that of Sienna five, and up to the present time that of Pisa has two only. Their collective salaries are thus distributed:—

Florence .....	£1,390
Lucca .....	330
Sienna .....	234
Pisa .....	100
Total .....	2,054

The reform sanctioned by the decree of the 30th September, 1852, has reduced the staff employed at the archives of Florence from thirty-three to twenty-two, and their collective salaries from £1,420 13s. to £1,040 13s. deducting the superintendent, who, in consideration of his old rank of professor and librarian, receives his emoluments from the University of Pisa. By the subsequent change of arrangement of the central management into the general superintendence with the addition of a School of Charters, the annual grant has been raised to its original amount, less a saving of £30 10s.

In order to complete these statistical data we give here the expenses incurred for the rebuilding and furnishing the four Record Offices:—

	Masonry.	Furniture, presses, &c.	Total Amount
	£	£	£
1853-61 Florence	2,151	1,883	4,203
1859-61 Lucca ...	1,400	612	2,412
1857-61 Sienna ...	334	637	971
1860-61 Pisa .....	400	576	936
	4,285	3,708	8,522

## 2074.—1798 bis. BONAINI, FRANCESCO, Florence.

All the collections to Libraries, Galleries, and Benevolent Institutions in Class XXIX. were prepared by M. Bonaini.

## 2075-2077.—(Wanting).

## SECTION VII.

## HISTORICAL AND FINE ART MUSEUMS.

**2078.**—1722\*, 2333.\* MAZZEI, Cav. FRANCESCO, *Florence*.

The palace of the Podestà at Florence.

Short notice on the restorations of the palace.

Photographic plans and drawings of different parts of the building, before and after the restoration.

“Del Pretorio di Firenze, lezione accademica, detta nella tornata della Società Colombaria, l'11 luglio, 1858, da Luigi Passerini, Firenze, tipografia delle Murate, 1858.

By a decree of the 30th November, 1859, the government of Tuscany preceding the annexation of that province to the kingdom, decreed the foundation of a museum intended to represent the national history, to be divided into the Etruscan, Roman, Mediæval, and Renaissance periods, to be formed by a collection of archaeological rarities dispersed throughout an infinite number of places, and sometimes very difficult of access.

The palace which the city erected in 1250, for the captain of the people, and which was afterwards the residence of the mayor, was appropriated to the purposes of the museum. It is not well ascertained whether the original idea is to be attributed to Lapo, a German, and master of the famous Arnolfo da Colle, but it is very certain that Fra Sisto of Florence, and Fra Ristoro da Campi, assisted in the project. It is not our purpose to give a detailed history of this edifice, and of the memorable events which have occurred within its walls. We shall only say that in 1574 it was degraded, in the most ignominious manner to make it the residence of the Bargello, captain of the men at arms of the government of the Grand Duke, and to erect prisons, and that in 1856, almost three centuries afterwards, on the proposal of M. Alessandro Manetti, at that time director of the civil buildings of Tuscany, it was determined to restore it to its original design, and, accordingly the work was confided to M. Francesco Mazzei, the architect, who has successfully accomplished this difficult work.

**2079.**—MUSEUM OF HISTORY, ART, AND ARCHÆOLOGY OF THE CAMPO SANTO OF PISA.

“Pitture a fresco Camposanto di Pisa intagliate da Carlo Lasinio, conservatore del medesimo. Firenze, Molini, Landi, &c., 1812.”

“Raccolti di sarcofagi, urne, altri monumenti di scultura del Camposanto di Pisa, intagliati da L. P. Lasinio. Pisa, 1820. (See also Van Lint. No. 2107.)

The paintings which ornament the walls of this celebrated monument, erected in 1278, by Giovanni di Nicola, of Pisan, are exceedingly valuable; the museum is enriched with Greek and Roman sarcophagi, which, at the commencement of the sixteenth century, were removed from the outside of the cathedral, where they were previously. But we are indebted to Professor Flaminio del Borgo, of Pisa, at the University of Pisa towards the end of the last century, for the original idea of collecting all the fragments of the ancient monuments dispersed over the city and its neighbourhood in this monument, itself so incomparable as a work of art; and to M. Carlo Lacino, keeper of the Campo Santo, the execution of this admirable project was confided.

The Campo Santo has been described by Giovanni Gherardo de Rossi, and Professors Sebastiani, Ciampi, and Giovanni Rosini. The two works which give the most exact idea of this monument have been sent by the libraries of the University of Pisa to the Exhibition.

**2080.**—2843\* R. ACADEMY OF FINE ARTS, *Ravenna*.

Plan of the building, drawn by M. Mazzotti, assistant-professor of architecture.

Elevation and longitudinal section.

Volume entitled "Atti di un quinquennio dell' Accademia provinciale delle Belle Arti in Ravenna. Ravenna, 1849, in 8vo.

**2081.--2324.\* GALLERY OF THE ROYAL MANUFACTORY OF PIETRE DURE, Florence.**

Plan of the establishment, with sections.

Photographs, representing the interior of the workshop and the show-room.

"Notizie Storiche sull' origine e progressi dei lavori di commesso in Pietre dure, che si eseguiscano nel R. Stabilimento di Firenze, raccolte e compilate da Antonio Zobi." Seconda Edizione. Firenze, 1853, 8vo. 1 volume.

It is supposed that Cosmo I. brought from Rome and Milan workmen skilled in the art of decorating furniture with rare stones; and that in this manner the manufacture of pietre dure had its origin in Tuscany towards the middle of the sixteenth century. This art, which must be distinguished from engraving on stone, of which at a rather more remote period, under Lorenzo de Medici, there had been celebrated artists, such as Benedetto Peruzzi, Giovanni dell' Corniole, &c., received afterwards a great impulse under the Medicis, Francesco I. and his successors, and still greater under the princes of the house of Lorraine.

They collected rich materials in the way of precious stones, not only from Tuscany and the rest of Italy, but also from all parts of the world; they established workshops, they engaged artists of first renown to prepare the designs, they taught workmen the art of sawing stones, and putting them together with pleasing combinations of colours and effect, so as to represent ornamental designs, buildings, flowers, and animals. This led to the production of such works as we see in the chapel of the

Medicis, commenced under Ferdinand I., and many others, which are greatly admired, both in the Pitti palace and other galleries, and even abroad, wherever the magnificence of the Medicis and their successors spread them. From this early manufacture by degrees a school of excellent artists has been formed, who now work on their own account, as will presently be seen. The most complete information on the subject is given in a work exhibited (*Notizie storiche sull' origine e progressi dei lavori di commesso in pietre dure, &c., per Antonio Zobi. Firenze edizione II., 1853.*)

**2082.— GALERIE DEGLI UFFIZI, Florence.**

40 photographs by Alinari Brothers, of the original works by Raffaele, existing in the Gallery.

"La R. galleria di Firenze pubblicata con incisioni in rame da una società sotto la direzione dei professori Lorenzo Bartolini, Giuseppe Bezzuoli, Samuele Jesi ed illustrata da Ferdinando Ranalli. Firenze, Batelli and Comp., 1841-52."

(See Class XXVIII., No. 1977.)

The numerous collection of works of art embraced in this public gallery, the formation of which goes back to the time of the Medicis, is composed of the master-pieces of all the schools, the Greek and Roman included, and of those which have distinguished the revival of the arts in Tuscany. That which contributes to increase the singular value of this gallery, is the collection of portraits of celebrated painters executed by themselves, 233 portraits of illustrious persons, and 28,000 original drawings from the days of Giotto down to modern times; besides printed works, medals, bronzes, statues, cameos, and Etruscan urns, all articles of extraordinary value.

This rich collection derives its name from the building called degli Uffizi, in the upper story of which it is deposited.

## CLASS XXX.

### FURNITURE AND UPHOLSTERY, INCLUDING PAPER HANGINGS, AND GENERAL DECORATIONS.

#### § 1. INLAID STONE WORK.

The manufacture of mosaics in siliceous stones, *pietre dure*, confined up to the present time to the Royal Gallery of the *pietre dure* of Florence, which have been referred to in Class XXIX., has been gradually developed elsewhere, through the efforts of several distinguished artists, who have directed their chief attention to works of a more moderate price and of larger sale. The *pietre dure*, consisting in varieties of quartz, felspar, granite, and porphyry, from different parts of Tuscany, Sicily, the Alps, and the remote regions of Russia and the East, are substituted by other stones of different degrees of hardness, which renders the work more easy, and, consequently, of lower price. This manufacture is called Florentine mosaics, a term often wrongly applied to mosaic work in general, and which, for this reason, we wish to distinguish from the work in *pietre dure* properly so called.

It is almost superfluous to remark that artists generally do not undertake important works in this material, peculiar skill being required both in design and execution.

Next to Tuscany and Florence the best work of this kind is made in Sicily, although at Naples other stones and lava are cut, but without making mosaic work, as at Florence.

We need not descant here upon the long and laborious processes, or the difficulties which have to be surmounted in the choice of the stones, and the taste and care required, as well by the designers as by the workmen employed in cutting and adjusting them.

**2083.**—1871. BARBENSI, GELASIO,  
*Florence.*

Small pietra dura table, representing S. M. Napoleon III., whole length, on horseback, with gilt casket and mahogany box.

Table with bouquet surrounded with lapis lazuli, eight trophies of flowers, band of amethysts, ebony feet, supports and frame gilt.

**2084.**—1801. BETTI, FRANCESCO,  
*Florence.*

Table with bouquet of flowers in the middle, and ornaments all round, with flowers, fruits, cups, and birds; feet in gilt wood.

**2085.**—1802. BIANCHINI, G.,  
*Florence.*

Eight tables in Florentine mosaic, belonging to Mr. Cracken, of London.

**2086.**—1803. BINAZZI, GIOVANNI,  
*Florence.*

Mosaic table.

Do. round table, pure slate, imitation of mosaic; new method.

**2087.**—1805. BOSI, E., *Florence.*

Oblong mosaic table, with gilt feet.

Two round tables of the same size, with gilt feet, and mosaic boxes.

Inlaid coffer in mosaic and bronze, with gilt feet.

**2088.—1819. ROYAL PIETRA DURA GALLERY, Florence.**

Table with Egyptian Nephrite ground, with flowers, shells, coral, &c.

Round Flemish table, with top of basalt, bouquet of flowers in the centre.

Table with flowers.

Drawing in *pietra dura*, representing the view of the tomb of Cecilia Metella.

Two cups in prophylpy of Egypt.

Ebony sculptured box with flowers in *pietra dura*.

Five cups mounted with various precious metals, in the style of Buvenuto Cellini.

Trophy for centre of table of the same sort.

Collection of *pietra dura*, employed in the Royal workshop of Tuscany.

(See Class I.)

(For the history of the establishment, see Class XXIX., No. 1.)

**2089.—1826. JANNICELLI, MATTEO, Salerno.**

Mosaic toilet.

M. Jannicelli is the only worker of this kind in Florence.

**2090.—1833. MERLINI, CARLO, Florence.**

Box of carved ebony, with alto rilievo representing birds and various fruits, plates of lapis lazuli, all in a frame of gilt bronze.

**2091.—1834. MONTELATICI, ANGELO, BROTHERS, Florence.**

Mosaic Florence table on basalt, of a round shape, with a bouquet of flowers and garlands, in the style of Raphael.

Round table with bouquet of flowers.

**2092.—1845. TORRINI, GICONDO, AND VIECCHI, CARLO, Florence.**

Table in Florentine mosaic, with bouquet of flowers, and arabesques all round.

Two tables of mosaic with flowers. Many small articles for brooches; paper weight, with flowers, animals, &c.

**§ 2. OBJECTS OF FURNITURE AND DECORATION IN VENETIAN GLASS-MOSAIC, IN IMITATION OF AVENTURINE, CHALCEDONY, AND OTHER STONES.**

The enamels and glass of Venice, formerly so renowned, are at the present day far surpassed by works produced elsewhere, on account of the general progress of trade and industry, and the improvements made especially in glass ware.

Nevertheless, the manufacture of Venetian glass still continues very active, amounting to 2,500,000 kilos, and employs 3,000 workmen.

To M. Bigaglia we are indebted for the recent important development and great improvements in the manufacture of glass imitating aventurine, enamel, *pietre dure*, chalcedony, jasper, agate, &c., for fine jewellery, or rich vases, mounted in gold and silver, of forms of the fifteenth and sixteenth centuries, for monumental decoration, pavements, mosaics, &c.; and to M. Salviati we are also indebted for a great manufactory of mosaics and miscellaneous articles in glass, of a very remarkable and important character.

**2093.—1849\*, 2015. BIGAGLIA, PIETRO, Venice.**

Round black marble table, inlaid with aventurine, enamelled with the same.

Small black marble table, inlaid (as above).

Black marble inlaid table (as above). Aventurine plate.

Silver gilt cover, with aventurine handles.

Paper weight, inlaid with aventurine and enamel.

Two bowls, with aventurine pedestals.

Tobacco boxes; three in aventurine and one in obsidian.

Four boxes, with articles in aventurine.

Two drawings, made of various small mosaics.

Aventurine cup in form of a shell, with pedestal representing a dolphin.

Two cups of minium, and one of litharge, used in enamel making.

**2094.—2021.\* BERTINI, —, Milan.**

Coloured glasses.

**2095.—2016. FRANCINI, GIUSEPPE, Florence.**

Glass for modern rooms, in imitation coloured glass. 14th century.

Large circular glass of the façade of the Cathedral of San Miniato.

**2096. — 2020\*. FRANCISCI, FATTORINI, AND MORETTI, Todi, Umbria.**

Painted glass.

**2097.—1860\*. SALVIATI, ANTONIO, Venice.**

Glass mosaic, Venetian style.

Models for bases of columns, panels and plates.

Mosaic byzantine table, copied from the figure of the Redeemer, placed behind the altar-piece of the Church of St. Mark, at Venice.

Mosaic monumental piece, model of basement, plate of chalcedony.

Tapestry in mosaic and in marqueterie, Venetian style.

Drawing of table in mosaic, Roman style.

Ewers of chalcedony, mounted in silver.

Model in silver filagree, of the Church of St. Mark, at Venice.

Ewers of chalcedony, mounted, three in silver, one in metal.

Coat of arms of Antonio Salviati, mosaic, Venetian style.

Samples of gold enamel, and of colours incrustated in ice.

Paper weight in Roman mosaic.

Various pieces of silver, plated with chalcedony, for the ebony foot of a table.

Chalcedony vase, with red spots, not mounted.

Samples of gold enamel rings, cut.

Inlaid paper weight, Venetian style.

Plate in coloured gold enamel.

Silver paper knife, chalcedony handle.

Photograph of chalcedony ewers, mounted in silver.

Gold brooches with inlaid work, Venetian style.

Inlaid gold buckle, Venetian style.

Inlaid gold head-dress, Venetian style.

Collar, gold broach, and three buttons, Venetian style.

Mosaic and gold head-dress, Roman style.

Gold seal, aventurine handle.

Silver gilt ornament, inlaid with precious stones.

Silver gilt brooches, of which three are silver.

Piece of monumental mosaic for a sample.

Drawing of Byzantine mosaic, representing St. Nicholas.

Plate, gold enamel.

Do., silver enamel.

Do., chalcedony.

Brooches, oval and round, in chalcedony, not mounted.

Chalcedony cover handles.

Chalcedony bell-handle.

Large chalcedony vase, or namented with silver, caliciform.

Pedestal of an altar, plated with chalcedony, and ornamented with white and gilt silver incrustations.

Glass plates.

Gilt wood baskets.  
 Fragment of wood frame for the fitting of marquetry mosaic.  
 Photography of chalcedony vases mounted in silver.  
 Small basin.  
 Jewel case.  
 Pillars, and various articles of chalcedony.  
 Sculptured lustre glasses, with ornaments in white and coloured crystal.

Flowers in white and coloured crystal.  
 Etui case, with bright clasp.  
 Bracelets of iron set with bright crystal.  
 Flowers in white and coloured bright crystal.  
 Leaves of green bright crystal.  
 Table of white marble inlaid in enamel and colour, Venetian style.

### § 3. ARTICLES OF FURNITURE FOR ORNAMENT AND DECORATION, IN ALABASTER, MARBLE, AND SERPENTINE.

Sculpture in alabaster has been much developed in Volterra and Tuscany, near the localities whence the material is extracted, and of which we have spoken in Class I., § 3.

At present M. Viti and M. Tangassi are the most enterprising in this branch of art; to the former we are indebted for a new method of hardening alabaster, by which means we can obtain works with ordinary labour from coloured alabaster, which are as hard as marble and other hard substances.

#### 2098.—1870. BACCI, FEDERICO, *Impruneta*.

Vases, urns, &c., in serpentine.

(See Class I., No. 158; see also Class I., sec. 5, No. 135, et seq.)

#### 2099.—1872. BENSI, CARLO, *Volterra*.

Two agate candelabras, with alabaster stands.

Two alabaster vases.

#### 2100.—1872 *bis*. BENZONI, ANGELO, *Pisa*.

Model of the church of Santa Maria de la Spina, at Pisa, in many coloured alabaster.

Model of the Pisa clock-tower, in white alabaster.

#### 2101.—1873. CHERICI, GIUSEPPE AND BROTHERS, *Volterra*.

Alabaster cup.

Alabaster candelabra.

#### 2102.—1811. COSTA, ANDREA, *Chiavari*.

Slate tables, inlaid with marble.

#### 2103.—1894\*. MICALI, GIACINTO, *Leghorn*.

Articles in alabaster.

#### 2104.—1878. PARENTI, GIUSEPPE, *Volterra*.

Invented vase of alabaster, historic, 15th century style.

#### 2105.—2337\*. PIEROTTI, PIETRO, *Milan*.

Plaster copy of Garston de Foix's monument.

Copy of a candelabra in Milan Cathedral.

#### 2106.—1861\*. TANGASSI, CARLO, AND BROTHERS, *Volterra*.

Pair of alabaster candelabras.

Alabaster cup.

Small ornamented cup.

United vase, turned.

Vase, ornamented with portraits of  
H.M. Napoleon III., and H.M.  
Victor Emmanuel.

Stag on legs.

Several other small articles.

Articles in alabaster.

**2107.**—1884. VAN LINT, ENRICO,  
*Pisa.*

Alabaster vase.

**2108.**—1846. VITI, Cav. AMERIGO,  
*Volterra.*

Two alabaster statues with columns.

Small alabaster statue.

Four tables inlaid in imitation of  
marquetry, in hardened alabaster,  
Personal ornaments in hardened  
alabaster.

Group of alabaster statues, executed  
by Louis Francois Arzalles.

VARIOUS ARTICLES OF FURNITURE  
AND DECORATION.

**2109.**—1887.\* BILLOTTI, Dr.  
PIETRO, *Turin.*

Two marble works, representing the  
family of Charles I., King of

England, after Vandyke; and  
St. Jérôme of Correggio. Price  
£50.

**2110.**—1857.\* INGEGNERI,  
PIETRO, *Scilla (Calabria).*

Terracotta figures of Sicilian and  
Abruzzan costumes.

**2111.**—1893.\* LIPPI, ANDREA,  
*Pietrasanta.*

Tea tray in statuary marble.

**2112.**—1895.\* NEGRONI, GAE-  
TANO, *Bologna.*

Work in engraved bronze.

**2113.**—1896.\* NORCHI, EGISIPPO,  
*Volterra.*

Various works in bardiglio ala-  
baster.

Serpentine and agate.

**2114.**—1897.\* PACINOTTI,  
FILIPPO, *Florence.*

Marble sculptures.

§ 4. ARTICLES AND ORNAMENTAL FURNITURE CARVED IN WOOD AND  
IVORY.

Sienna exhibits the history of wood carving in all its phases. It flourished most in the fourteenth century, but declined from the seventeenth to the eighteenth. During the present century it again recovered its old position, both as to taste and workmanship, under the care of several distinguished artists.

We can trace the art of the fourteenth century in the massive structures placed in the panels of the choir of the Cathedral of Sienna in 1387. During the following centuries, we see the works of such masters as Francesco Tonghi, Thesée de Bartolino, Benedetto Giovanni de Montepulciano, and of Antonio Barili, in the Cathedral, the town hall, Mount Olivet, and elsewhere.

Antonio Manetti and Angelo Barbeti were the first to attempt the restoration of this art in our days, and it has since reached a high degree of perfection, by the works of Antonio Rossi, Pietro Giusti, Lodovico Marchetti, Anges Lombardi, Pasquale Leoncini, and Achille Lavagnani. We owe to M. Giusti the revival of sculpture in ivory. He is superintendent of the School of Ornamental Design at the Royal Institute of Sienna, which receives 150 pupils, whose attention is principally directed to sculpture.

**2115.**—1886. AMBROGIO, GIUSEPPE, *Brescia.*

Cork carving, representing the battle of Solferino.

**2116.**—1848\* BARBETTI, ANGELO AND SON, *Florence.*

Sideboard carved in walnut wood.

Carved wood frame.

Carved walnut furniture.

A seat of carved walnut.

Prie-dieu of carved walnut.

**2117.**—1804. BOCCHIA, EUGENIO, *Parma.*

Watch-case in carved wood.

**2118.**—1888. BRILLA, ANTONIO, *Savona.*

Crucifix in ivory.

**2119.**—1810. COEN, MOSE, *Leghorn.*

Richly-carved sideboard, with elegant ornaments for a dining-room.

**2120.**—1889\* COLETTI, MATTEO, *Florence.*

Carved wood frame.

**2121.**—1820. FRANCESCHI, EMILIO, *Florence.*

Looking-glass and console table for dressing-room,

Four console tables, with shells and fruits.

Two frames and drawers, with frieze and tope.

Two sky-light frames.

Four small consoles, with heads.

Twelve ovals for miniatures, collection A.

Six ovals for miniatures, collection B.

Two console tables, with cupids.

Eighteen small ovals for lithography, collection C.

Four ornamented ovals, and a fan.

Two large ovals for mirrors.

Two console tables, with dragons.

Two console tables, with flowers and birds.

Twelve ovals for portraits and miniatures. Collection D.

Oval, in form of a linden tree.

**2122.**—1821. FRULLINI, LUIGI, *Florence.*

Devils, in walnut wood, copied after the original of Jean Bologna.

Carved walnut box for desk; 14th century style; designed by the exhibitor.

Heads of fantastic animals carved in walnut wood, for consoles; designed by the exhibitor.

Little ebony caskets, with figured bas-reliefs, and a little group above, in walnut, representing Cupids, and other ornamental bas-reliefs; designed by the exhibitor.

Portrait of S.M. Victor Emmanuel, carved in jujube-wood.

Wood bas-relief, representing Charles VII., King of France, and Pier Capponi.

Bas-relief, representing the conspiracy of Pazzi.

**2123.**—1891.\* GARASSINO, VINCENZO, *Savona.*

Christopher Columbus, small ivory statue.

**2124.**—1823. GIUSTI, PIETRO, *Sienna.*

Coffer carved in ivory.

Small carved ivory casket, with foliage.

Cupids and birds. 16th century style.

Casket carved in walnut wood, ornamented with figures; Italian style, of the 16th century.

Collection of 40 rough gilt wood frames, partly sculptured with simple ornaments, partly ornamented with figures in the style of the 14th, 15th, 16th, and 17th centuries.

The workshop of M. Giusti, at Vienna, employs ten young men, carvers in wood, three cabinet makers, and 24 others, carvers, cabinet makers, gilders, &c. The value of their united labour rose, from 1852 to 1856, to £1,000, from which we must deduct £800 for working materials and labour. Since 1858 there has been a great diminution in the sale, caused by public events.

**2125.**—1825. HOLMAN, ROBERTO, *Florence.*

Old-fashioned cupboard.

**2126.**—1877. LOMBARDI, ANGELO, *Sienna.*

Carved walnut-wood casket, highly ornamented.

**2127.**—1879. PAPI, LODOVICO, *Florence.*

Carved casket.

**2128.**—1880. PICCHI, ANDREA, *Florence.*

Model of ten ebony caskets.

Do. six walnut caskets.

Do. seven jujubier caskets.

Do. one hair casket.

Do. four gilt-wood caskets.

Made by a machine of M. Picchi's invention.

**2128 bis.**—1881 *bis.* RIPAMONTE, *Milan.*

Suite of exquisitely carved bedroom furniture.

**2129.**—1898.\* SARTORI, GIOVANNI, *Venice.*

Various works in carved and gilt wood.

**2129 bis.**—1842. SCALETTI, ANTONIO, *Florence.*

Oval walnut casket, with foot.

Tabernacle in ebony and ivory, 15th century style, with bas-reliefs, representing the Holy Family, by Raphael Sanzio, copied in wood. The property of H. M. the King of Italy.

Small ebony and ivory chest, in the style of the 15th century, ornamented with animals and figures; designed by the maker.

Vessel for holy water, in jujub-wood, ornamented with figures, &c., in bas-relief.

Inkstand of ebony, ivory, and bronze gilt, embellished with allegorical animals, &c., and ornamented with figures and architectural designs in bas-relief; designed by the exhibitor.

**2130.**—1895. ZAMBELLI, GIOVANNI BATTISTA, *Milan.*

Wood carving, representing the De-feat of Barletta, of large size, 35 centimetres by 49.

## § 5. FURNITURE IN MARQUETERIE, JAPAN, &c.

The art of inlaying in wood was much admired by the ancients, who have left us many magnificent evidences of their proficiency, but in the course of the last few years it has been brought to still greater perfection in Italy. Thanks to the persevering labours of certain artists, it has at last become possible to obtain with wood the same harmony of shades and colours formerly thought to belong exclusively to mosaic in *pietre dure*.

Florence, Brescia, Savona, Turin, and Perugia have hitherto distinguished themselves most in this art, and they are worthily represented in the Exhibition.

The designs are not always as pure and correct as they might be, but they have notably improved in the course of the last few years, as is shown by the works of M. Lancetti and of M. Montineri, of Perugia. The art of inlaying is practised in many other parts of Italy, besides the towns already named, and a large number of workmen are employed in it.

**2131.**—1800. BARTOLOTTI, GIUSEPPE, *Savona*.

Collection of tables, inlaid with rare kinds of wood.

**2132.**—1850.\* BUCCI RAFFAELE, *Ravenna*.

Inlaid table.

**2133.**—1806. CANTIERI, GIUSEPPE, *Lucca*.

Small work-table made under the direction of Prof. Bianchi, inlaid with ebony, tortoiseshell, native wood, and ivory, and coloured by the process of M. Verciani.

(See Class II., No. 328.)

**2134.**—1808. CENA, GIORGIO, *Turin*.

Round walnut-wood table, carved and inlaid with tortoiseshell and metal.

Secretary of pink ebony and Indian walnut, with internal mechanism. Invalid chair, on three wheels, to facilitate the transit from one room to another.

Carved box of walnut-wood.

**2135.**—1851.\* CHALON AND ETIENNE, *Florence*.

Inlaid floor.

Model of the same on a small scale.

**2136.**—1809. CIACCHI, GIACOMO, *Florence*.

Inlaid floor.

**2137.**—1852.\* CORRIDI, PASQUALE, *Leghorn*.

Table of angelite.

**2138.**—1812. DELLAVALLE, PIETRO, *Leghorn*.

Table of inlaid tortoiseshell.

Tables of coloured scagliola, &c.

**2139.**—1853.\* FONTANA, DOMENICO, *Milan*.

Secretary, 15th century style, inlaid and carved in ebony.

The architecture, the design of the friezes and figures, the carvings and sculptures, are entirely the work of M. Domenico Fontana, executed in 1861.

**2140.**—1822. GARGIULO, LUIGI, *Sorrento*.

Small articles of furniture, inlaid with native woods.

**2141.**—1891.\* GARRASSINO, VIN-CENZO, *Savona*.

Picture in wood mosaic.

**2142.**—1854\* GATTI, GIOVANNI BATTISTA, *Rome*.

Casket.

**2143.**—1855\* GHIRARDI, GIOVANNI, *Brescia*.

Furniture.

**2144.**—1856\*. GRANDVILLE, MICHELE, *Sorrento*.

Inlaid table of several native woods.

Cigar-case.

Music-desk.

A box.

**2145.**—1826. JANNICELLI, MATTEO, *Salerno*.

Toilet-table in mosaic.

**2146.**—1827. LANCETTI, FEDERICO.

An ebony table, richly inlaid in wood of several colours, ivory, and mother-of-pearl, with feet of Indian walnut. The property of H.M. the King of Italy.

Small jewel casket of ebony, inlaid with different sorts of wood, mother-of-pearl, ivory, and metals. Style, 15th century.

**2147.—1828. LEVERA, BROS. AND Co., Turin.**

Large book-case, inlaid, with bronze ornaments.

Wooden bedstead, antique style.

Closet in three compartments, do.

Chest of drawers.

Oval table, inlaid with silver, with bronze ornaments.

Arm-chair, gilt.

Do. in rose-wood.

Do. in ancient wood.

Chairs.

We must specially notice the manufacture of the brothers Levera, who during the last ten years, have greatly improved this branch of the trade.

A great number of workmen are employed in their factory, who produce many articles of furniture, carved, gilt, and inlaid. The models show to what perfection this branch of industry has been brought in Italy.

**2148.—1830. LUCCHESI, BROS., Lucca.**

Small table, serving as an *escritoire*, design of Professor Bianchi, inlaid with ebony, mother-of-pearl, brass, copper, silver, tortoiseshell, buffalo-horn, ivory (white, and coloured, in an indelible manner, according to the process of Mr. Verciani.

(See Class II., No. 328.)

**2149.—1829. LURASCHI, ANTONIO, Milan.**

A billiard-table of wood, marble, and metal, the invention of the exhibitor.

A more common billiard-table, the invention of the same.

**2150.—1831. MAINARDI, BATTISTA, Milan.**

Inlaid table of the roots of box and ebony, with a frieze of metal and tortoiseshell, and a picture in mosaic, designed by the maker.

The friezes are executed according to a special process, which greatly economises time. The material of the mosaic has been also produced by Mainardi, who has moreover made the mosaic itself, by means of a particular process realising a great saving of time and money. The inventor can execute these mosaics at a price of 8s. 6d.

**2151.—1832. MARTINOTTI, GIUSEPPE, AND SONS, Turin.**

Bedstead, inlaid with brass, with silk curtains.

Wardrobe, with three panels.

Gilt frame.

Frame.

Antique sideboard.

Table, inlaid with brass, mother-of-pearl and tortoise-shell.

Bureau of mosaic.

Wardrobe in three divisions, invented by the manufacturer, having a bedroom in the interior.

Bedstead by the same inventor, containing bedroom furniture; bureau, bed, secretary, toilet, pedestal-table, glass, table, two portmanteaus. The bed is provided with wool and elastic mattresses, arm chair, and two other chairs.

The splendid collection of furniture of M. Martinotti indicates that his manufactory is on a large scale. It has justified the hopes which were entertained in 1830, by the Chamber of Commerce of Turin, at the time of the Fifth Industrial Exhibition of Piedmont.

**2152.—1835. MONTENERI, ALESSANDRO, Perugia.**

Three pieces of wood, inlaid, intended for an article of furniture, in which the Triumph of the Nation will be represented.

In the first niche are represented Venice, Rome, Florence, and Naples; in the second, the palace of the Doges in Venice, and in the third the court of St. Mark, in the same city.

**2153.**—1837. MUSICO, DOMENICO, *Messina*.

Chairs.

**2154.**—1859\*. NOVI, COSTANTINO, *Brescia*.

Inlaid table.

**2155.**—1838. ODIFREDI, GIOVANNI, *Leghorn*.

Piece of furniture, richly inlaid in different woods, ivory and metals, to serve as a bureau and toilet table.

**2156.**—1839. PASQUINI, GASPARE, *Florence*.

Veneer of walnut-wood, cut with a circular saw, newly invented.

**2157.**—1843. SCOTTI, IGNAZIO, *Genoa*.

Oval table, inlaid.

Round table.

Work table.

**2158.**—1862\*. ZAMPINI, LUIGI, *Florence*.

Fire screen in lacquer work, in eight separate pieces, with Chinese figures.

Fire screen in lacquer work, in bas-relief, in eight separate pieces, belonging to H. M. the King of Italy.

**2159.**—1847. ZORA, G., *Turin*.

Floor of inlaid wood.

FURNITURE AND DECORATIVE ARTICLES  
IN ORDINARY USE.

**2160.**—1872 *bis*. BRUSCA, J. BATTISTA, *Milan*.

Model of a stove in wood.

**2161.**—1807. CANEPA, J. BATTISTA, *Chiavari*.

Chairs.

**2162.**—1813. DELLEPIANE, LORENZO, *Savona*.

Chairs.

**2163.**—1814. DE MARTINO, GABRIANO, *Naples*.

Toilet in mahogany, with peculiar mechanism.

**2164.**—1815, 1816. DESCALZI, GIACOMO, *Chiavari*.

Chairs.

**2165.**—1817. ESCOUBAS, MARIE AMELIE AND SCOTTI, IGNAZIO, *Genoa*.

Tables.

**2166.**—1890\*. FIESCHI (CONSERVATORY), *Genoa*.

Artificial flowers.

**2167.**—1892\*. GARNIER-VALETTI, FRANCESCO, *Turin*.

Artificial fruit.

(For artificial flowers, see Class XXVII., No. 1855, 1890.)

**2168.**—1855\*. GHIRARDI, GIOVANNI, *Brescia*.

Furniture.

**2169.**—1824. GUALA, GIUSEPPE, *Turin*.

Chimney piece in walnut wood.

**2170.**—1818. WORKHOUSE (*Piacenza di Lavoro*), *Florence*.

Sideboard in walnut wood, with veneering sawn by the machine of Mr. Pasquini.

(See No. 2156.)

**2171.**—1858\*. MORESCHI, GIO-  
VANNI ANTONIO, *Brescia.*

Small table.

**2172.**—1836. MOROZZI, FRAN-  
CESCO, *Florence.*

Veneering sawn by machinery.

**2173.**—1840. RIGHINI, CARLO,  
*Milan.*

Chamber furniture.  
Various chairs.

**2174.**—1841. ROVELLI, CARLO,  
*Milan.*

Curtains.

**2175.**—1844. SQUERZO, VINCENZO,  
*Savona.*

Chairs.

## CLASSES XXXI. AND XXXII.

### IRON AND GENERAL HARDWARE.

We gave in our description of Class VIII., a lengthy enumeration of the different foundries for the working of metals. Nevertheless, in adding a few words to complete this portion of the history of the Italian manufactures, and to determine precisely what may be considered as belonging more exclusively to this class, we may state that iron wire is made chiefly at Lecco, Oregna, Ponte, Pignerol, Pistoia, and Rome. At Lecco alone from 6,000 to 7,000 quintals of iron wire, of different thicknesses, are produced. A considerable quantity is also made in the works at Oregna, whence it issues either simply as wire, or in the form of chains, springs, knitting-needles, forks, nails, screws, &c. In the territory of Lecco, and in the Valsassina, they manufacture mattocks, spades, anvils, vices, anchors, and chains of various sizes. The Val Camonica produces ploughshares, stoves, ladles, &c. The Val Trompia, fire-arms, and arms of every description; the Val Lomazza, a branch of the Val Trompia, produces chisels, some parts of weapons, and many articles of domestic use at a very low price, as, for instance, iron forks at 4d. the dozen, forks and spoons at 4s. 2d. the dozen, saw blades at 2s. 1d. the dozen, and tailors' scissors at 10d. each. In the Valsassina they manufacture razors, small pruning knives, and scissors. At Viconago, Milan, Turin, Florence, Spoleto, &c., they make files and rasps; in the territory of Cantu, small nails; in the Valsabbio, nails, pickaxes, scythes, hoes, and lamps. At Brescia, Milan, Florence and its environs, Scarperia, Biella, Pistoia, Campobasso, &c., they make penknives, razors, scissors of the finest quality, and, finally, surgical instruments and sharp instruments of every kind. At Milan there are several manufacturers of safety-locks and strong boxes, which are even in some request in foreign countries. The names of Vago, Citterio, and Prestiti are deservedly famous. There are also manufactures of these articles in almost every town in Italy, and every maker of any ability strives to discover and introduce new combinations; thus Genoa is noted for the ornamental strong boxes of Caruti; Florence for those of Gaspard Ciani.

In nearly all the towns of Lombardy and Piedmont, and in other towns of the kingdom, as, for instance, at Florence, Ancona, Bologna, &c., they manufacture iron furniture, such as bedsteads, tables, chairs, window-frames, &c.; these are occasionally made hollow. Wire gauze

of every kind is also made, and especially of iron, at Palermo, Pescia, Genoa, and Milan. The plates of nearly half a millimetre of thickness, made at Dongo, are used in the button manufactories at Milan. Steel and iron stoves, &c., and ploughshares are made in great quantities in the province of Brescia, and the latter also in other parts of the kingdom.

The manufacture of all these articles may acquire considerable importance when the means of transport shall have been increased and rendered cheaper, and especially when the use of iron for building, and for furniture, and in the thousand other things for which it is employed elsewhere, and for which it is destined to be used even more largely, shall be more fully understood in Italy.

The foundries for cast-iron are now very numerous, and may be grouped according to the quality of the iron employed, different results being obtained as its nature and proportions vary. The foundries of Lombardy deal with the native iron, mixed with English, and sometimes with Tuscan iron. This mixture was first adopted for economy, to add to the fluidity of the iron of the country. Now it is found necessary to add to the cheaper English iron a third, or a half of the native iron coming from Dongo, Bondione, Cemmo, Cerverno, Allione, and Pozzasse, so as to give greater strength to the rods of steam-engines, and, in general, to those objects that are exposed to much friction, or that have to present great resistance to all the causes of fracture. The iron of Premadio, near Borenio, not only adds great strength to a mixture of English iron, but also makes it extremely fluid, and renders it capable of filling the mould exactly without any subsequent contraction in the refrigeration. The foundries where this mixture is used are those of Como, Dongo, Lecco, Fiumenero, Bergama, Monfiano, Carcina, Brescia, and Milan. The royal arsenal of Turin makes use of the iron of the Val Camonica, mixed with others, to make cannon. At the foundry of Carcina they make conical projectiles by casting them twice, and then working them on an engine-lathe.

The blast furnaces of Dongo, Premadio, Bondione, Gavazzo, Cemmo, Cerverio, Allione, and Pozzasse, often work with only one casting, and they nearly all produce projectiles. They use English iron almost exclusively in the foundries of Palermo, Ancona, Ferrara, Leghorn, Genoa, Lucca, Pisa, Cagliari, Cremona, &c. Those of Pietrarsa, Portici, and Naples also use the iron of Mongiana. That of Follonica makes use specially of the cast-iron obtained in the blast furnaces of the place itself. Here they execute works requiring both one and two castings.

The art of casting in bronze has been known in Italy from the very earliest times, as is shown by the numerous works belonging to the Etruscan and Roman periods now exhibited in our museums. Naples, Rome, Florence, Turin, and Milan, have in our own day executed castings of great value; they contain several important foundries conducted with much ability. The ornament that surmounts the Arch of Peace, at Milan, representing, in colossal proportions, Peace on a triumphant car, drawn by six horses, and surrounded by four steeds ridden by Fame, was cast in bronze. This work required 640 quintals of metal. The melting and the running off were done in the Manfredini establishment, at La Fontana, near Milan. The statue of Charles Emmanuel of Sardinia was cast subsequently. In the foundry of M. Papi, at Florence, several pieces of sculpture, such as the Abel and Cain of M. Dupré, and the head of David, have been produced. It is now preparing to cast the whole of this colossal statue. We must also mention the foundries of M. Cali, at Naples, and of M. Colla, at Turin. The Manfredini establishment, having completed the works already mentioned, was compelled to bestow its attention on works of smaller size, and it is now reduced to casting bells, which are made of a new kind of bronze, invented by the Brothers Barigozzi, and differing in the proportions of the various metals from that formerly used. Many artists who had been employed in these great works, and had acquired considerable skill, established small crucible castings for timepieces, candelabra, lustres, small ornaments, so that the manufacture of articles in bronze which already existed at Milan, increased considerably in consequence of its division. The foundry of La Fontana could still be used for every kind of casting.

The foundries of church bells are still very numerous in Italy, and retain considerable vitality. The smaller ones also make plates of brass; in past times this art was of great importance, but even now this plate brass is used to manufacture chandeliers, lamps, ornaments of every kind, portions of engineering instruments, taps of all sizes, &c. At Saint Apollonio, in the Valley of Lumezzano, province of Brescia, there are 24 small foundries for making plate-brass for the hilts of weapons, and other articles in domestic use.

## § 1. ARTICLES IN IRON AND STEEL.

**2176.**—1901. ANGIOLILLO, GIUSEPPE ANTONIO, *Campobasso*.

Lock suitable for warehouse door.

**2177.**—1902. AZZERBONI, CAMILO, *Pontassieve (Florence)*.

Secret lock for a strong box.  
Three small locks.

**2178.**—1903. **BALDANTONI**, GIOVANNI BATTISTA, AND BROS., *Ancona*.

Single iron bedstead.

Double do.

Iron bedstead, between the above sizes.

**2179.**—1905. **BARBERIS**, AUGUSTINO, *Turin*.

Engraved scissors and penknives.

Different articles of cutlery.

MM. Barberis and Bertinara are also well known manufacturers of surgical instruments. (See No. 1446 and 1448.)

**2180.**—1905. **BECCALOSS**I, FRANCESCO, *Brescia*.

Large collection of nails for various purposes, made by hand and by machinery; curry-combs, pincers, screws for beds, knives and forks, window-hinges, hammers, trowels, spoons, brass hilts, brass lamps.

**2181.**—1288. **BERTINARA**, GIUSEPPE, *Turin*.

Surgical instruments.

**2182.**—1929.\* **BEVILACQUA**, PASQUALE, *Campobasso*.

Lock with a new kind of spring.

**2183.**—1928.\* **BOLGI**, TERESA, *Brescia*.

Articles for domestic use, made of wire gauze and iron wire.

**2184.**—1906. **BOLZANI**, SAVERIO, *Milan*.

Specimens of hand-made brass and iron gauze.

Bolzani's manufactory has long been established at Milan. It produces 26,000 square metres of metal gauze a year, and employs 20 workmen.

**2185.**—1982.\* **BUFFI**, GUSTAVO, *Scarperia (Florence)*.

Various articles of cutlery.

**2186.**—1907. **CALEGARI**, VINCENZO, *Leghorn*.

Cast-iron work.

Iron spiral.

Mr. Calegari has a large establishment where he makes steam engines, hydraulic presses, &c., and employs about 100 workmen.

**2187.**—1908. **CAMPOBASSO** (SUB-COMMITTEE FOR THE EXHIBITION).

Ironwork for gates.

Bells for cattle.

**2188.**—1910. **CESARI**, GAETANO, *Cremona*.

Iron strong box, with cast-iron and bronze ornaments.

**2189.**—1911. **CIANI**, GASPARE, *Florence*.

Safety locks with several springs, invented by himself; one with 720 combinations, price £3 10s.

Seven locks, which may have an undetermined number of combinations; and one lock to be put on without screws, with a secret spring, which, by leaving the key in the lock, discover the attempts made to open it.

**2190.**—1912. **CIMA**, GIOVANNI BATTISTA, *Lecco (Como)*.

Hardware.

**2191.**—1913. **COBIANCHI** (VITTORIO), *Omegna, Piedmont*.

A piece of iron wire heated with charcoal, and made without reheating, by being passed through the gauge-plate from No. 22 to No. 1. Price 90 centimes the kilogramme.

Besides this wire, which is made into nails, Mr. Cobianchi also manufactures iron rolled after having been heated with charcoal. He employs 45 workmen, whose wages vary from 5d. to 4s. 7d. a day.

**2192.**—1983. DE STEFANO, BROTHERS, *Campobasso*.  
Scissors and razors.

**2193.**—1967. DUINA, ANGELO, *Brescia*.  
Specimens of agricultural tools and instruments.

**2194.**—1915. FORNARA, GIOVANNI, *Turin*.  
Samples of wire gauze, and of various kinds of similar work.  
Collection of samples of wire gauze used in agriculture and manufactures.  
Collection of samples of the combs used in weaving various kinds of tissues.

**2195.**—1916. FRANCI, PASQUALE, *Sienna*.  
Iron rail made with a hammer; very remarkable as a piece of art.

**2196.**—1100. GELLI AND DELLE PIANE, *Pistoia*.  
(See Class IX., No. 1279.)

**2197.**—1917. Ghibellini, Vincenzo and Domenico, *Perugia*.  
Japanned iron table, with compartments for articles of the toilet.  
Japanned iron sofa.

**2198.**—133.\* GIACOMELLI, Pio, *Lucca*.  
Samples of steel.

The name of M. Giacomelli must be added to those who have attempted the manufacture of steel. He has exhibited certain bars tempered to different degrees, which are to be commended; the smaller ones want homogeneity, which is caused rather by the imperfection of the means at present at his disposal than by the process he adopts.

**2199.**—1968. GRAVINA, MICHELANGELO, *Campobasso*.  
Various steel articles, scissors, penknives, razors, &c.

**2200.**—1918, 1940.\* GUPPY AND PATTISON, *Naples*.  
Small iron and brass nails.

**2201.**—1103. JACUZZI, GIOVANNI BATTISTA, *Pistoia*.  
(See Class IX., No. 1280.)

**2202.**—1105. LEOLI, NICOLA, *Brescia*.  
(See Class IX., No. 1281.)

**2203.**—1919. LONDINI, BROTHERS, *Bologna*.  
Two iron bedsteads joined together.

**2204.**—1914. WORKHOUSE, (PIA CASA DI LAVORO), *Florence*.  
Iron bedstead.  
Camp bedstead with mattress.  
Camp bedstead to serve as an arm chair.  
Iron toilet-table.  
Washstand.  
Table.  
Chair.  
Clothes stand.

**2205.**—1922. MOSSONE, GIOVANNI BATTISTA, *Andorno Cacciorna* (Novara).  
Lock for a strong box.  
Do. for a shop.

**2206.**—1931.\* NESTI, FERDINANDO, *Florence*.

Helmet hammered out of a single piece of iron.

(See Class XI., No. 1393.)

**2207.**—1969. OLMETTA, ANTONIO, *Cagliari*.

A knife.

(See Class XVII., No. 1456.)

**2208.**—1925. RUSCONI, ANTONIO, *Brenno*.

Samples of ladles and frying pans, sold to the trade; the first at 8d., the second at 1s. the kilo. Samples of ploughshares of various forms, at £2 1s. 8d. the quintal.

Among the articles made of iron produced in Lombardy, we may notice frying pans and ladles, manufactured principally at Bienno and Malegno, in the Val Camonica, province of Brescia, where there are no less than twenty-five small forges devoted to this branch of industry. The annual production, though considerably diminished in the course of the last few years, still amounts to 3,000 quintals. The manufacture of ploughshares is also very important; it amounts to 8,000 quintals in the Val Camonica; ploughs and ploughshares of more than a hundred different shapes are made in the twenty forges scattered throughout the valley.

(See Class IX.)

**2209.**—1970. SANTANGELO, SCIPIONE, *Campobasso*.

Various steel articles.

Scissors, penknives, razors, &c.

**2210.**—1971. SELLA, LUDOVICO, *Masserana (Novara)*.

Knives, penknives, razors, &c.

**2211.**—1926. SIMION, GUGLIELMO, *Pescia (Lucca)*.

Frame to make paper, with a portrait of H. M. the King of Italy.

**2212.**—1927. SPANO, LUIGI, *Oristano (Cagliari)*.

Lock for a desk on the Sardinian system.

**2213.**—1984.\* SPINA SANTALA, FRANCESCO, *Acireale (Catania)*.

A scythe.

**2214.**—1120. TORELLI, DANIELE, *Luco (Florence)*.

Sheep shears.

Hatchet for pruning olive trees.

**2215.**—1985\*. TORO, PIETRO ANTONIO, *Campobasso*.

Scissors.

**2216.**—1973. VENDITTI AND TERZANO, *Campobasso*.

Articles in pierced steel.

Knives, scissors, penknives, and razors.

**2217.**—1974. VILLANI, RAFFAELE, *Campobasso*.

Articles in pierced and damascened iron work.

Hunting knives.

Carving and dessert knives.

**2218.**—1978. VINEIS, MANMOTTA GIULIO, *Mongrando (Novara)*.

Scythe for hay, called *ranza*.

**2219.**—1975. VINEIS, GIOVANNI BATTISTA, *Biella (Novara)*.

Scythe for hay.

**2220.**—1979. VINEIS SERAFINO AND BROTHERS, *Novara*.

Scythe for hay, called *ranza*.

**2221.**—1976. VINEIS, BARONS, BROTHERS, *Mongrando (Novara)*.

Scythe for hay, called *ranza*.

**2222.**—1977. VINEIS, CESARE, AND BROTHERS, *Mongrando (Novara)*.

Scythe for hay, called *ranza*.

**2223.**—1980. VINEIS, TESTA DE MORTE, BROTHERS, *Mongrando (Novara)*.

Scythe for hay, called *ranza*.

**2224.**—1981. VINEIS, TESTA DE MORTE, VITTORIO, AND NEPHEWS, *Bongrando (Novara)*.

Scythe.

## § 2. CAST IRON ARTICLES.

**2225.**—1930.\* DE LA MORTE, FILIPPO, *Naples*.

Ornamental iron casting.

**2226.**—1920. MACRY, HENRY AND Co., *Naples*.

Cast candelabra.

Various ornamental castings.

**2227.**—1924. PIETRARSA (R. ESTABLISHMENT OF), *Naples*.

Several ornamental castings.

Cast watchstand.

Bust of J. Watt.

## § 3. ARTICLES IN BRASS, LEAD, BRONZE, "PACK-FONG," &c.

**2228.**—1900. ALFANO, ANTONIO AND GIOVANNI BATTISTA, *Naples*.

Twin bedsteads in "pack-fong" and pinchbeck.

**2229.**—1936. CAMILLETTI, ANTONIO, *Perugia*.

Bronze candelabra in the style of Pompeii.

Two bronze inkstands.

Bronze figure of Moses, with pedestal.

**2230.**—1945. COLOMBO, NATALE, *Milan*.

Manufactures in lead and pewter.

**2231.**—1948.\* DECOPPET, LUCIANO, *Turin*.

Lead pipe, tinned inside.

Lead piping, according to the Roman system.

Lead piping, by hydraulic pressure.

**2232.**—1946. KRAMER AND Co., *Milan*.

The lead piping made by the house of Kramer of Milan, at Cavallchina, is manufactured cold, by the application of hydraulic pressure, equivalent in weight to 1,800,000 kilos. The method was first invented by this house, in 1830, and it is now adopted by many other houses in Italy and elsewhere. The annual produce amounts to 1,200 quintals. The dimensions of the tubes are from one to ten centimetres; their length is unlimited.

**2233.**—1949. LAU, AUGUSTO, *Naples*.

Metal articles for household use.

**2234.**—1937. MANUELLI GIUSEPPE, *Prato*.

Household utensils in copper.

**2235.**—1938. MARINELLI, TOMMASO, *Agone (Molise)*.

No. 8. Bronze bells for churches, with hammers of the ordinary shape, which give the eight musical notes; these bells are made in a peculiar manner, so as to give all the semitones, from the highest to the lowest. They may be fitted

with a key-board, so as to be used in theatres. Price of the eight bells, £68.

**2236.**—1938 *bis*. MIGLIORI, MEMETE, *Florence*.

Small chapel in brass, made by hand, composed of 700 pieces screwed together. Price £28.

**2237.**—1921. MOMBELLI, GIUSEPPE, *Milan*.

Collection of large and small pins, and small nails.

**2238.**—1939.\* PENZA, FRANCESCO, *Naples*.

Copper gilt ornaments.

**2239.**—1947. SEMMOLA, FRANCESCO, *Naples*.

Various articles worked in metal.

**2240.**—1932.\* TEODORANI, SEBASTIANO, *Forlì*.

Roman balance with brass weights.

**2241.**—1218.\* TURIN (ROYAL ARSENAL).

Statue of Balilla throwing the stone at the Austrians (vide *Botta Storia d'Italia*). Work in bronze, executed by Giani.

(See Class XI., No. 1404.)

§ 4. IRON ARTICLES FOR SPECIAL PURPOSES.

**2242.**—1904. BARGIANI, FRANCESCO, *Pisa*.

Horse shoes for race horses, in the English style.

**2243.**—1228.\* CASSANI, EMILIO, *Milan*.

Eyeglasses mounted in steel.

The eyeglasses mounted in different metals by M. Cassani will bear comparison with any to be found elsewhere. Their mounting is admired for its lightness, elegance, and finish. The manufactory, though still in its infancy, produces some thousands of spectacles yearly, and sends them to many of the towns of Italy, and even France. They may be purchased in the warehouse at 60 francs the dozen. See Class XIII., No. 1409.

**2244.**—1909. CECCHETTI, PIETRO, *Pisa*.

Two veterinary instruments.

Two horse-shoes, in the English style, the one for the fore and the other for the hind feet.

**2245.**—1960.\* CERIE, CARLO, *Lucca*.

Steel bit.

Spurs.

(See articles of fine Cutlery, Class XVII.)

## CLASS XX XIII.

### WORK IN PRECIOUS METALS, & THEIR IMITATIONS; JEWELLERY; ARTICLES OF VIRTU, &c.

In Italy, the art of working in precious stones and metals suffers from the same causes as all other branches of national industry. Though deprived of a common centre, which would promote its manufacture on a large scale, the jeweller's art gives rise to a considerable trade, which is not the less important from the fact of its being divided. It comprehends three distinct classes: 1st, Jewellery in gold and silver; 2nd, Jewellery in gold and precious stones; 3rd, Stones and various materials employed in making jewels and necklaces.

Jewellery in gold and silver is made in all the large towns of Italy, and even in some of the large hamlets; considerable manufactories exist in Turin, Naples, Milan, Cremona, and Rome. Previous to 1848, Milan contained 38 workshops; but subsequent political events have reduced their number to 12. In Pavia there are 13 workshops, remarkable for their exquisite taste; Genoa is noted for the special and somewhat important manufacture of filigree in gold and silver. The principal workshops are twenty in number; there are 260 manufacturers of filigree, and a hundred merchants. The number of persons occupied in this branch of industry may be thus classified:—

Manufactures of jewellery in gold	...	...	...	145
" " in silver (wholesale)	...	...	...	152
" " in silver filigree	...	...	...	68
Clerks and workmen	...	...	...	1,500
Women and girls, engravers	...	...	...	250
				2,115

The division of labour, which has been adopted in Genoa, has produced the most happy results, and each workman having adopted an individual speciality, the work, as a whole, has been brought nearer to perfection.

In all the ancient states of Italy, now constituted into a single kingdom, the stamp was compulsory on all articles of jewellery. It is to be desired that, influenced by wiser principles of economy, a new law should render stamping optional, and should free commerce from this obligation, which checks its advancement.

	Gold.	Silver.	Silver gilt.
Brought to be stamped, in 1855, kilts.	328,991	1,497,900	75,730
" " in 1860, "	549,228	1,806,405	102,280

The importation of foreign jewellery has increased during the same period, and it has come through Genoa, in considerable quantities, to supply the demands of the inland market. Jewellery in gold and silver, and particularly articles in filigree-work, which constitute a special native art, are exported to America, Holland, Spain, and Portugal.

The working in stones and different materials for jewellery, includes a great number of specialities exercised in several provinces. In Rome they produce Roman mosaics; various cameos in *pietre dure*, well known in the trade, are also wrought there. At Naples, cameos in lava of Vesuvius are made, and imitations of the articles discovered in the Ruins of Pompeii. Coral, too, is specially carved there, likewise in the form of cameos.

At Florence the art of mosaic in *pietre dure*, called Florence mosaic, has acquired great importance in certain shops, where necklaces and other ornaments set in gold are specially made. The enamels produced here are held in high estimation.

## § 1. JEWELLERY.

**2246.—2007.\* AVOLIO AND SONS,**  
*Naples.*

Collection of ornaments in lava.

**2247.—1990.\* BELLI, PIETRO,**  
*Leghorn.*

Plate in iron and gold representing  
a picture.

**2248.—2009.\* BORANI, Cav.**  
*Carlo, Turin.*

Civic crown, with precious stones,  
presented by the Italians to General  
Cialdini after the taking of  
Gaeta.

Tea service.

Punch bowls.

(See class XI., for articles in lava.)

**2249.—2011.\* CASTELLANI,**  
*Rome.*

Imitations of Etruscan and Roman  
jewels and ornaments.

Fifteen years ago, Mr. Castellani attempted  
to recover the process employed by the ancients  
in making jewellery, and to reproduce  
the forms they used, varying them at will, but  
preserving the general type. This gave rise  
to a complete renovation in Roman jewellery,  
to a decrease in foreign importations, and a  
corresponding increase in the local manufacture;  
so that instead of the £28,000 paid  
to the government, in 1848, for stamping the  
jewellery imported from abroad, £32,000 are  
now paid for stamping the jewellery exported.

**2250.—2364.\* ROYAL COMMISSION FOR THE INTERNATIONAL EXHIBITION.**

Sword presented by the Romans to  
H. M. Victor Emanuel, in 1859,  
made by Castellani.

Sword presented by several cities  
of Central Italy, made by Rinzi.  
Sword presented by the workmen  
of Mongiano.

**2251.—2012.\* ERCOLANI,**  
*Emilio, Florence.*

Copy of the St. John of Donatello,  
chased. Price, £8.

**2252.—1993. FORTE, EMILIO,**  
*Genoa.*

Bonbonnières. Sweetmeat boxes.

Model of steamboat in silver filigree.

Bason and ewer.

Various articles in filigree.

**2253.—1995. GHEZZI, ANTONIO**  
*AND SONS, Milan.*

Three chased silver chalices.

Six chalices in copper, silver plated.

Four small vases in copper, silver  
plated.

Three remonstrances in copper, silver  
plated.

Remonstrance in beaten silver.

Six chandeliers in copper, silver  
plated.

Cross in copper, silver plated.

Lecturn in bronze, silvered and  
gilt.

Four reliquaries in copper, silvered  
and gilt.

Ten lamps in copper, silver plated.

Twelve silver epaulettes.

Brooch and basin, in silvered copper.

Two censers do.

Censer in silver.

**2254.—1996. GRISETTI, E.,**  
*Milan.*

Chased gold brooches, set with  
stones.

**2255.—1099. MASINI, GIUSEPPE,**  
*Naples.*

Silver lamp, with chased figures.

Electrotype crucifix.

Bronze crucifix.

Articles in lava.

**2256.—2000. MINOTTINI, GIUSEPPE,**  
*Perugia.*

Reliquary, chased and gilt.

**2257.—2360.\* NANNEI, GIOVANNI,**  
*Florence.*

Silver cup, made from a single piece.

Model for the above, in brass, also from a single piece.

Model of a plant, from one single piece of silver. Price £1.

**2258.—2362.\* PANE, MICHELE, Naples.**

Small silver vase, beaten from a single piece.

Silver crucifix.

Silver skull.

Heads for walking sticks.

**2259.—2002. PELLUFFO, VIN-CENZO, Cagliari.**

Gold crown used by peasants.

Gold cross, with pearls.

Pair of gold buttons.

Gold earrings, for peasants.

Silver garland.

Silver toothpicks.

Silver chain and reliquary.

Silver chatelaine, used by the peasants in Sardinia.

**2260.—2001. PARAZZOLI, L., Milan.**

Ring, serving as perpetual calendar.

**2261.—2003. PIERONI, ADOLFI, Lucca.**

Silver figure, representing Judith. Price £120.

Coins and medals.

**2262.—2004. PIEROTTI, P., Milan.**

Sword hilts, helmets, breastplates, &c., reproduced from ancient models by a galvanoplastic process.

**2263.—2005. ROCCA, RINALDI, AND ALGERI, Modena.**

Monument to Benvenuto Cellini.

Silver table ornament, figures in alto and basso relievo.

**2264.—2365.\* SALVIATI, ANTONIO, Venice.**

Silver filigree, representing the church of St. Mark.

Silver ornaments.

**2265.—2367.\* SICHLING, ANTONIO, Turin.**

Allegorical sword, the property of H. M. the King of Italy.

§ 2. CARVED STONES.

**2266.—1991. CALVI, G., Ripa-teatina (Abruzzi).**

Jewels in stones, from Vesuvius.

Price of the collection, with casket, £6 to £8.

**2267.—2014.\* GERMANI, GIOVANNI, Cremona.**

Head of Andromache, engraved in oriental hyacinth, 42 millimetres by 35 mil. in diameter, 85 mil. in depth, set in gold, with silver ornaments and bronze foot.

We must remark the depth of the carving, the expression of the countenance, the flexibility of the flesh and hair. The name of the artist, Mr. Beltrami, imitator of the ancient glyptographs, is engraved in very small characters in the midst of the hair. Price £280.

**2268.—2361.\* NEGRONI, GAETANO, Bologna.**

Flower basket, in gilt bronze, with figures, foliage, and emblems of music.

**2269.—2368.\* TRARI, MARIEN, Bologna.**

Ornament in engraved crystal (hyalography).

## § 2. CORAL.—MARQUETERIE IN TORTOISESHELL AND PRECIOUS METALS.

Coral is an important branch of industry and commerce in Italy. Genoa, Leghorn, and Naples, have been from old times the three great entrepôts to which the raw material has been carried, and where skilful artificers have established themselves in order to work at its transformation. Coral is obtained in large quantities in the Mediterranean and at considerable depths, of from 200 to 600 feet. Four varieties are distinguished: 1st, red, which is subdivided into deep crimson red, paler red, and vermillion, which is very rare; 2nd, black; 3rd, clear white; 4th, veiled white, which is the most common. The produce of the fishery varies from one year to another, and even in the richest spots the fishery should only be carried on at fixed intervals. The coasts where this precious zoophyte is found in the greatest abundance, are those of Corsica, Sardinia, Provence, Africa, the vicinage of Trapani, and the straits of Messina.

Three hundred and forty Italian barques, manned by three thousand four hundred sailors, are employed in this fishery. The profit realised on the average by each boat is from £280 to £320; and the total profit may be estimated at £180,000.

The raw coral is sold in the markets of Genoa, Leghorn, and Naples, where it receives its first polish, and undergoes its successive manipulations.

The price of the raw coral varies according to the size of the pieces:—

		£	s.	d.		£	s.	d.
The smallest, called	<i>Ferraglio de Sardaigne</i> , by kilo., from	0	0	9	to	0	0	10
"	" <i>Barbarie</i> ... ..	0	1	10	to	0	2	2
Medium size,	" <i>Fanagliatura</i> ... ..	1	1	6	to	1	4	2
Large size,	" <i>Fanagliatura</i> , of Sardinia, ..	...	...	...	...	4	4	0
"	" " of Barbary, ..	...	...	...	...	4	12	6

Besides several secondary establishments, there are in the city of Leghorn four principal manufactories for working in coral. Each of these employ from 250 to 300 workmen, this branch of industry thus giving occupation to a thousand women. The coral which is annually wrought into little globules, round, egg-shaped, smooth, or cut into facets, &c., amounts to 25,000 kilos. The greater part is sent to the East Indies by way of Marseilles; a large portion is exported into Germany, especially for necklaces of an inferior quality, destined to serve as funeral ornaments. It is also sent into Russia, where this article is in great demand. The total value of these exportations is not less than £20,000. Naples and Sicily derive an annual profit of £88,000.

The quantity of coral brought yearly to Genoa, amounts to 36,950 kilogrammes, worth £480,000. There are 24 coral sellers in this city, 14 of whom have their own manufactories.

The greater part of the coral is wrought into beads; this work, which consists of three different operations, cutting, piercing, and rounding, is executed by the country people, and principally by the women of the Val de Bisagno. The manner in which it is distributed among the inhabitants of the different communes of the valley, affords a fine example of the principle of division of labour. All the workmen employed in cutting belong to about one hundred families in the commune of Assio. Those in piercing and rounding, to about sixty families living in other parts of the valley. Each village works exclusively at beads of a fixed size. The inhabitants go to Genoa to procure the raw material from the coral sellers, and to take back the coral which they have wrought. In Genoa, each manufacturer employs from ten to twenty women or more, who submit the coral to a preparatory process before it is given to the workers of Bisagno.

Upwards of thirty men or women are employed in their own homes in cutting coral with facets. There are perhaps thirty engravers of cameos on coral.

Without exaggeration, it may be affirmed that from 5,000 to 6,000 persons in the province of Genoa gain their living, either by fishing, working, or selling coral, and that this craft produces a revenue of £80,000. Genoa exports its coral to Austria, Hungary, Poland, England, Madras, Aleppo, and Calcutta.

2270.—1990. AMBROSINI, GIOVANNI, *Naples*.

Coral necklace, ear-rings, brooches &c.

2271.—1990.\* CAGLIARI (SUB-COMMITTEE OF).

Coral from the coast of Sardinia.

**2272.—1992. DELLA VALLE, PIETRO, Leghorn.**

Specimens of work in *scagliola*, imitating coral.

Malachite, &c., for inlaying.

Brooches in *scagliola*, in imitation of the Florentine mosaics.

**2273.—1994. FUSCO, GIUSEPPE, Naples.**

Coral necklace of a single piece.

Brooch, representing a gun and game bag.

Breast-pin, representing a warrior.

Do. do. bunch of grapes.

Brooch, in form of a horse-shoe.

Ear-rings and shirt studs, in lava from Vesuvius.

**2274.—1997. GUIDA, CARLO, Trapani.**

Wrestling Cupids, in coral, on alabaster base. Price, £15.

Coral cameo—the Car of Thetis. Price, £5 5s.

Shell cameos—Cupid, Mars, Venus, and Vulcan. Price, £4.

Shell cameos, representing Astyanax. Price, £4.

Coral group, alabaster base. Price, £40.

Coral cameo—the Car of Alexander (copied). Price, £12.

Shell cameo—Hercules. Price, £8.

Shell cameo, representing the Forge of Vulcan. Price, £8.

Shell cameo—Venus burning the arrows of Cupid. Price, £8.

**2275.—1998. LABRIOLA, GIUSEPPE, Naples.**

Articles in tortoiseshell, inlaid with gold.

**§ 3. MEDALS, COINS.**

Before Italy was constituted into the present kingdom, the cities of Turin, Milan, Genoa, Florence, Bologna, Naples, and Palermo, had each a mint of their own, working, for the most part, with dies, according to the ancient system; the machines of Ulhorn and Tonnelier being employed only at Turin, Naples, and Bologna. For several years the mints were nearly abandoned, and that of Genoa was dilapidated. They were under the administration of the government of the countries to which they respectively belonged, excepting those of Genoa and Turin, which had been farmed. At present, the mints of Turin, Naples, and Milan only have been retained, they having been farmed by the National Bank, and largely supplied with tools and machinery. Those of Naples and Milan will be able, in the space of eighteen months, to strike money to the value of £960,000, in the new coinage which is to form the monetary system of the new kingdom.

The ancient states of Naples and Tuscany had, for a long time, adopted silver alone as their circulating medium, whilst the double type of gold and silver existed in the other provinces; and in the ex-duchies of Parma and Modena, where no law fixed the monetary standard, the coin of France and other neighbouring countries was in circulation. A recent law of the Parliament has extended the double type, gold and silver, to the whole kingdom, not in a definitive manner, it is true, but to obviate certain inconveniences arising in the different provinces from exceptional and temporary circumstances.

The manufacture of medals, which is always confined to the mints, has not yet reached that degree of perfection which might have been expected in a country like Italy, where a taste for the fine arts is so strongly developed.

The mints of Turin, Bologna, Florence, and Naples have sent specimens of their productions to the Exhibition. Professor Santarelli, and the Advocate Thomas Corsi, also exhibit; the former, the works of his father; the latter, those of Manfredini, de Lendy, and de Canzani. The mint of Florence sends several models of ancient medals, among others, some of Cellini. On the whole, the most remarkable productions are those of Cerbara, Girometti, and Ferraris, artists who deserve the special attention of those who are interested in this art.

**2276.—2011.\* CORSI, TOMASO, Florence.**

Nine different medals, viz :—

In bronze. 1. Demetrius Canzani.

„ gilt, 2. „

„ silver-plated, „

In bronze. \*Lendy.

In silver.

„ Microscopic incision on the reverse, representing the Custom-house stamp.

1. Lendy.

In bronze. 1. \*Manfredini.

„ 1. \*Lendy.

**2277.--2008\*. MINT OF BOLOGNA.**

42 different Medals, viz. :—

In copper. 1. \*L. Santerelli.

„ 1. \*Cacqué

„ 2. Fabris.

„ 1. Girometti.

„ 1. \*Bianchi.

„ 2. Cossa.

„ 1. Carbara.

„ 1. P. B. S.

„ 1. P. C. F.

In silver 15. \*Girometti.

„ 2. \*Bianchi.

„ 1. \*Zaccagnini.

7 Gold coins.

90 Silver coins.

11 Copper coins.

4 Silver and copper coins (experiment).

**2278.—2013.\* MINT OF FLORENCE.**

173 different medals, viz. :—

95 of the time of the Medicis.

In pewter, 43. \*Author unknown.  
copper, 1. \* Do.

pewter, 4. \*Benvenuto Cellini.

„ 20. \*Michele Mazza.

„ 9. \*Gaspard Mola.

„ 14. \*Weber.

copper, 4. \* Do.

And 78 of a subsequent period.

In pewter. 10. \*Luigi Sines.

„ 14. \*Carlo Sines.

In pewter. 2. \*Mathenkoff.

„ 2. \*Merlini.

„ 2. \*L. Santerelli.

„ 8. \*Pietro (Cinganelli).

„ 2. \*Cinganelli & Pisa.

„ 2. \*Cinganelli & Gobri.

„ 2. \*G. Niderost.

„ 2. \*P. Girometti.

„ 4. L. Gori.

„ 6. Mariotti and Gori.

„ 2. Cerbara.

„ 2. Pieroni.

„ 2. Ferraris and Vagnetti.

„ 2. Fernasi.

„ 2. Ferraris.

In copper. 2. Cinganelli and Gori.

„ 2. Cerbara.

„ 2. Pieroni.

„ 2. Ferraris and Vagnetti.

„ 2. Luigi Gozi.

**2279.--2361\*. MINT OF NAPLES.**

15 various medals, viz :—

In silver, 10.

In copper, 5.

**2280.—2369\*. MINT OF TURIN.**

100 various medals, viz :—

In bronze, 35. Ferraris.

„ 7. \*Levy.

„ 47. \*Galeazzi.

„ 6. \*Thermignon.

„ 2. \*Cavigiole.

„ 1. \*Puttinetti.

„ 1. \*Girometti.

„ 1. \*Bartolozzi.

„ 1. De Giovanni.

**2281.—2366\*. SANTERELLI, EMILIO (Professor), Florence.**

11 various medals, viz :—

In silver, 5. Luigi Santerelli,  
(exhibitor's father)

In bronze, 5.

Bronze gilt, 1.

## CLASS XXXIV.

## GLASS.

Italian glass wares are very inadequately represented in this Exhibition, both as regards the number of exhibitors and the nature of the articles themselves. It is very difficult to obtain correct statistical information on this branch of industry.

In 1858 there were sixteen glass-works in the ancient provinces, without reckoning those of Savoy and Nice. In Sardinia, there was one; in Lombardy twelve; in Venice, forty; Lucca, one; Ferrara, one; in the Neapolitan provinces, ten; in Bologna, two; and in Parma two. There were nine exhibitors from Tuscany at the Florence Exhibition of 1861, to whom prizes were awarded. We may safely affirm that there are in the Italian territory no less than ninety glass-works.

This multilicuity of manufacturers is partly the result of the division of Italy into small states, and of the difficulties connected with their inland trade, which will necessarily be diminished by the union of the provinces, and by the new means of communication. Instead of the numerous and imperfect glass-works, incapable of any great improvements, it is to be hoped that others will be substituted affording greater facilities for production and sale, and that an adequate amount of capital will be supplied, so as to enable them to introduce the improvements of art and science.

The manufacture of glass in Italy, however, presents perhaps a greater variety than can be found elsewhere. With the exception of cast plate-glass, the Italian glass-works supply every article suited to the elegancies and requirements of life, adapting themselves, as to shape, to the traditional habits of each province.

There are, besides, the well-known specialities of the glass-works of Venice and Murano. Painting on glass has been cultivated with success; and many artists of Milan, Florence, Perugia, have attained celebrity in this art.

Hitherto the Italian manufacturers have made but few chemical instruments, although they succeeded in their first attempts; but the very limited demand disinclined the manufacturers from receiving orders, more especially as they had not always sufficiently experienced workmen at hand to execute them.

The Italian glass works suffice almost entirely for the home market, and at the same time afford a considerable export in certain articles, with Algeria, Turkey, America, Greece, &c. Venetian glass finds a sure market in every part of the world.

The raw material used in the Italian glass works varies according to the localities. In the ancient provinces they make use of the *amorphous quartz*, carried down in pebbles, or in shapeless masses, by the Alpine torrents, and which is generally of spotless whiteness. The manufacturers of Naples employ the quartz sand of Trapani, and for black bottles they make use of the volcanic substance known under the name of obsidian.

At Florence they employ the sand of the Arno, which is collected at Figlino. Chalk is supplied from the various lime pits which abound in the peninsula; the potash is obtained in several provinces (Piedmont and Tuscany), from the ashes of land vegetables, while the soda is extracted in Sardinia and Sicily from the ashes of marine plants. The manganese, used for whitening the glass was, till recently, brought almost exclusively from the mine of St. Marcel, in the valley of Aosta; deposits of manganiferous ore, have, however, been now discovered in the Alps. It is also found in the Island of Sardinia, at *Capo Rosso*, on the western coast of the Island of S. Pietro, at Padria, in the neighbourhood of Alghero, and at Sas Covas, near Rosa. (See Class I.). The manganese obtained from these ores is of excellent quality, and adapted to the use of glass manufacturers.

The varied nature of the geological formations in Italy leads us to conclude that, by proper research, every description of raw material used for making glass, and, with few exceptions, for colouring it, might be found in excellent quality and in great abundance. If experience even proves that boracic acid may be used without inconvenience in the manufacture of oxyde of zinc crystal, (a manufacture which has perfectly succeeded in the hands of Messrs. Maës and Climendot, of Paris), Italy would be placed in circumstances peculiarly favourable to its production.

Were researches and experiments made to improve and extend this branch of industry, an increase in the exportation would be the result. On the other hand, the importation would be diminished, though it now represents a considerable value for certain articles, such as crystal ornaments. During the last few years, in the ancient provinces alone, the importation amounted to £80,000, and in the Neapolitan state to £40,000.

In several Italian glass works broken glass is collected at a small expense, to be melted with the addition of a little raw material, and an article is produced which finds purchasers on account of its cheapness.

Wood is the combustible generally used in the Italian glass works, from whence it arises that the greater number are found in the neighbourhood of vast forests. Some manufactories use lignite, for instance that of Nocetti, near Mondovi. The peninsula abounds in woody districts from which a good supply of fuel may be obtained; but it is desirable that such processes should be adopted in the glass works as would reduce to its minimum the quantity of wood employed, wood being quickly consumed, but slowly reproduced. The Italian glass trade, which has always been considerable, will undoubtedly increase in the future. There can be no doubt that the new state of things in Italy will be much more favourable to it than the old, as it will allow of the establishment of extensive works, the natural consequence of peace and a united country.

**2282.**—2015. BIGAGLIA, PIETRO,  
*Venice.*

(See Class XXX., No. 2093.)

**2283.**—2030. BRUNO, GIUSEPPE,  
*Naples.*

Glass shades, round and oval.

**2284.**—2020.\* FATTORINI AND  
MORETTI, *Todi (Umbria).*

Window in coloured glass.  
,, enamelled glass.

**2285.**—2016. FRANCINI, G., *Florence.*

(See Class XXX., No. 2095.)

**2286.**—2035.\* MENCACCI, MAN-  
SUET AND Co., *Lucca.*

Tazzas.

Tazzas, flower vases, bottles, de-  
canters (*fiaschi*) flacons, &c.

**2287.**—2034.\* MORGANTINI AND  
BERNADINI, *Ravenna.*

Articles in blown glass.

**2288.**—2017. PACINOTTI, FI-  
LIPPO, *Florence.*

Engraving in coloured crystal.

**2289.**—2018. SALVIATI, ANTONIO,  
*Venice.*

(See Class XXX., No. 2097.)

**2290.**—2036.\* SEVOULLE,  
BENIAMINO, *Vicini (Salerno).*

Window glass.

Ditto.

Glass shade.

**2291.**—2033. VENICE (UNITED  
MANUFACTORIES).

Various articles in Venetian glass.

## CLASS XXXV.

## POTTERY.

It is not our intention to retrace the history of the manufacture of pottery, but rather to give a general view of its actual state in Italy.

As we have seen in Class I., the raw materials of this branch of industry are not wanting in Italy. The northern part, from the last hills of Friuli to the Tyrol, and even as far as Montiviso and the Appennines, abounds in silica, felspar, sulphate of lime (calc sinter) and carbonate of lime, &c., while everywhere throughout the Italian soil are scattered marl, siliceous and aluminous clays, fire-clay and caolin, used in making porcelain; there is also found the boracic acid, for which every other country is indebted to Italy. The general state of the pottery trade may be seen by referring to the subjoined table. The method used for preparing the raw material and in working its subsequent transformations greatly vary, according to places and circumstances and the end in view. Besides articles of an ordinary description, many are found which have been brought to great perfection.

The want of capital is the greatest hindrance to this branch of industry, and consequently every attempt at improvement, and at obtaining an extended market, is almost baffled by foreign competition.

• GENERAL STATISTICAL TABLE OF THE ART OF POTTERY IN ITALY.

Nomenclature.	Potteries.	Persons employed.	Annual Profit.
			£
Common glazed crockeryware .....	240	12,000	200,000
Common earthenware .....	30	1,800	48,000
Varieties of coloured earthenware .....	24	2,400	96,000
Glazed flint ware (English) .....	3	350	18,000
Porcelain .....	3	250	16,000
Tiles and paving bricks .....	2,000	80,900	1,600,000
Total .....	2,300	97,700	1,978,000

## § I. TERRA COTTA. COMMON POTTERY.

This first branch of pottery comprehends especially the making of tiles, both for paving and roofing, of oil jars (*coppi orci*), and of common earthenware of every description. It is generally carried on in the open air, and there is hardly a village in Italy which is not provided with a pottery sufficing for its own requirements; and yet, neither the processes employed, nor the general state of things, are very praiseworthy, especially as compared with the ancient Romans.

A large quantity of tiles and coarser earthenware is made in the province of Pavia. It is very favourably situated, from its abundant supply of marl, and the facilities afforded by the waters of the Tessin and the Po, both for conveying the fuel and the articles produced. Among the places in Tuscany where this manufacture is carried on, we must name Montelupo, Impruneta, Figline de Prato, for paving tiles and articles in fire clay or apyrrous.

Common paving tiles belong to the first-class; we include in the second, paving tiles of fire clay, as also stoves, furnaces, and crucibles, the production of which is extensively carried on under the auspices of various manufacturers in Italy. Moreover, all the glass and gas works of importance manufacture the pottery required for their own use.

But the articles made of fire clay which we have enumerated not being adapted for blast furnaces, this want is supplied by the manufactures of Tolfia, near Civitta-Vecchia, and those of Richard, at St. Cristoforo, near Milan. They are obliged, however, to have recourse to the foreign market for a certain amount of the raw material, owing to the insufficient supply of clays capable of withstanding a high degree of heat.

The stoves, furnaces, &c., produced at Castellamonte (Piedmont), Canavais, Biellais, and in Tuscany, are held in high estimation, and are coming into more general use, owing to their solidity, their elegance of form, and their moderate price. The only improvement of which they are susceptible is a more judicious management of the heat.

The manufacture of utensils for domestic use, plain or ornamented, glazed or unglazed, is so universal that each province supplies its own wants. Let us specially note the manufactory of the brothers Legnani, at Cassano d'Adda (Lombardy), for the number and quality of its articles, imitating roots as to form, and tortoiseshell as to colour, and adapted for the preparation of food. We should also mention the very enterprising and interesting manufactory of brown vases, with lead glaze, situated in Albisola, near Savona (Genoa); and another manufactory of garden pots, of all shapes and dimensions, at L'Impruneta, in Tuscany; and that of Fontebasso, at Treviso, which supplies a great number of these same articles, coated with a crystalline glaze.

The manufactory of Imoda, at Turin, and that of Stella and Co., at Castellamonte, furnish bottles and decanters of various kinds, conduits and pipes in stoneware, of tolerably good quality. A larger supply of gas pipes, water pipes, &c., is, nevertheless, desirable.

Each of these manufactories endeavours more or less to give elegance of form and colour to the articles it sends forth, but the firm of Boni and Co., of Milan, maintains an incontestible superiority. By means of the excellent preparation of their materials, they have succeeded in ornamenting two palaces in the capital of Lombardy in a new and original style. The considerable importation into the province of Biella of kitchen utensils which can stand heat, renders it very desirable that these articles should be made in greater numbers in the district.

#### ENGLISH EARTHENWARE AND FINE STONEWARE.

Most of the earthenware of which the basis consists in marl and chalk, and which is covered with a tin glaze, is produced in the same manufactories as the more common articles already spoken of. In this branch the establishment of the Marquis Ginori Lisci, at Doccia, in Tuscany, excels all the others, as well in the more useful articles as in ornamental vases of every kind, plain, embossed, and coloured.

Pipe-clay with a basis of chalk, comes principally from the Vincentine, from Trevignan, from the provinces of Savona and Mondovì, and from Turin, Bologna, Pisa, Palosco (Brescia), Sovero (Bergamo), Campione (Lago Cesere), Laveno (Verbano), Lodi, and Rome. These clays, used for making many common articles, are good in appearance, but, unfortunately, brittle; though, in truth, the very low price at which the articles must be produced in order to hold their own against the foreign manufactures, makes it difficult to obtain a better quality.

These articles are generally made at a low temperature; they are baked with faggots or with some other inferior kind of fuel. Many establishments use peat.

#### EARTHENWARE.

The manufacture of earthenware in the English fashion is nowhere carried in Italy to so great an extent as in the establishment of W. J. Richard and Co., at San Cristoforo, near Milan. That of Galvani, at Pondenone (Venetia), also deserves special mention.

In general the articles produced are good, and capable of bearing comparison, especially as regards strength, with the English earthenware. But the supply is far from bearing a due proportion to the ever increasing demand, notwithstanding the energetic efforts made by Mr. Richard and Co. to produce on a larger scale. It is to be desired that new manufactories should everywhere be established, but the present duties on this article are so onerous as to discourage enterprise.

It is very important that we should notice here that the kind of fuel principally used for baking these articles is peat. The first establishment where it was employed for this purpose in Italy was that of San Cristoforo, near Milan, and this was accomplished by means of a peculiar system of ovens invented by the proprietor and director, Mr. Jules Richard, in which it is possible to obtain any desired degree of temperature.

The economical advantage of such an invention which allows the substitution of a cheap for an expensive kind of fuel, has been so generally recognised, that the Lombard Institute of Letters, Arts, and Sciences, awarded a special medal to the inventor.

## PORCELAIN.

There are three principal manufactories in Italy for the production of hard, semi-transparent porcelain:—That of Ginori Lisci, at Doccia, near Florence; that of Ginori, at Turin; and that of St. Cristoforo, near Milan.

This branch of the ceramic art is extending more and more, and especially at the last-named establishment, which is highly favoured by its industrial, commercial, and economical position. The manufactures of these establishments consist essentially of articles in common use, such as tea, coffee, and dinner services. Mere ornaments are produced in much smaller quantities, owing to the impossibility of competing with foreign importations.

The establishments of Ginori and Richard furnish also a great quantity of articles used in chemistry, such as capsules, vessels, and a prodigious number of telegraphic isolators of various shapes, for the use of the State.

For a short time Mr. Richard's establishment has also been employed in the production of delicate semi-transparent English porcelain, made with phosphates and felspar, but want of time has prevented him from sending any to the Exhibition.

**2292.**—2040. ARMAO, GAETANO,  
*St. Stefano di Camastro, Messina.*

Imitations of ancient pottery.  
Paving tiles.

**2293.**—1870. BACCI, FEDERICO,  
(See Class I.)

**2294.**—2041. BELTRAMI, C.  
PIETRO, *Cagliari.*

Pottery.  
Bottles in *terra cotta*.

**2295.**—2041 *bis*. BRUSA, J. B.,  
*Milan.*

Large house stove.

**2296.**—2042. CALVETTI, Avv.  
GIOVANNI, *Turin.*

Flower pot in *terra cotta*.

**2297.**—2054.\* CAROCCI, FABRI,  
AND Co., *Gubbio (Perugia).*

Amphora, of large and medium size.

Different vases, of diameters varying from 32 to 38 centimetres. Prices, £3 5s. to £8.

Plates of 24 to 27 centimetres. Prices, £3 5s. to £6 5s.

Vases of different sizes, with handles; diameters, 25, 15, 57, and 32 centimetres. Prices, £5 5s. to £25.

Plates, with ornaments in relief; diameters, 24 to 37 centimetres. Prices, £6 to £23 5s.

**2298.** 2043. COLONNESE, FRANCESCO, *Naples.*

Flower pots in *terra cotta*.  
Do. imitation of Etruscan.  
Do. do. Greco-Sicilian.

**2299.**—2044. FERNIANI, Count  
ANNIBALE, *Faenza (Ravenna).*

Imitation of ancient earthenware.

**2300.**—2045. GALEAZZO, JACOPO  
ANTONIO, *Castellamonte (Turin).*

Oven in *terra cotta*.  
Rumford stove in fire clay. Price  
2s. 1d.

**2301.**—2046. GINORI-LISCI,  
Cav., *Florence.*

Porcelain. Miniatures on slabs, statuettes, vases in alto and basso rilievo, box with bronze and ebony fittings, bas-reliefs, and dinner services.

Imitation Chinese porcelain, articles of virtu, &c.

Earthenware in imitation of that of Urbino and Pesaro in the 14th and 15th centuries.

- Imitations of Lucca de la Robbia ware, articles in common use, yellow earthenware, paving tiles, chemical vessels, ornaments, and garden chairs, pots, &c.
- 2302.**—2055.\* FURLINI, G., AND Co., *Florence*.
- 2303.**—2047. MARRAS, FIDELIO, *Asemini (Cagliari)*.  
Collection of pottery.
- 2304.**—2056.\* MOSSO, BROTHERS, *Turin*.  
Water pipes.  
Flower pots.  
Coffee pot in the style of Antibio.
- 2305.**—2048. OLIVIERI AND FERRO, *Savona (Genoa)*.  
Tobacco pipes.
- 2306.**—2048 *bis*. PIEGAJA, RAFFAELE, *Lucca*.  
Models of architectural ornaments in terra cotta.
- 2307.**—2056\* PULITI, CAMILLO, *Pelago*.  
Pot for oil (*orcio*).  
Terra cotta flagon, and articles of domestic use.
- 2308.**—2049.\* RICHARD AND Co., *Milan*.  
Dinner service in white porcelain.  
Hollow capsules and laboratory apparatus.  
Service in ornamented porcelain.  
Paving tiles in fire clay.  
Articles in terra cotta, English method.  
Samples of earthenware glazed without lead.  
Peat used in the baking of earthenware, &c.
- 2309.**—2050. RONDANI, TOLOMEI, *Parma*.  
Earthenware diaphragms, tubes, &c., for galvanic batteries.  
Furnace for enamelling.  
Box for cosmetics in *terra cotta*.
- 2310.**—2051. SAVONA (JUNTA OF).  
Collection of common pottery.
- 2311.**—2052. SPANO, LUIGI, *Cagliari*.  
Collection of pottery.
- 2312.**—2053.\* BERTE AND STROBEL, *Parma*.  
Tiles in fire clay.  
Clay and quartz used in the manufacture.

## CLASS XXXVI.

### DRESSING CASES, DESPATCH BOXES, AND ARTICLES USED IN TRAVELLING.

- 2313.**—2071.\* GHEZZI, ENRICO, *Milan*.  
Portmanteau, and articles used in travelling.
- 2314.**—2070. CORA, D. AND SONS.  
Portmanteau.  
(See for other articles Classes XXVI. and XXVII.)

# Official Catalogue of Works of Art.

## CLASS XXXVII.

### ARCHITECTURAL DESIGNS AND MODELS.

#### SECTION I.

##### A.—DESIGNS.

##### BACCANI, GAETANO.

- 2141-5. A Court of Justice . . . . . *Fine Arts Academy, Florence.*

##### BARABINO, CARLO.

- 2146-51. Carlo Felice Theatre, at Genoa . . . . . *Ligurian Academy.*  
2152-7. The Academy at Genoa . . . . . *Ligurian Academy.*

##### BETTARINI, LUIGI.

- 2158-61. A Military College . . . . . *Fine Arts Academy, Florence.*

##### BIANCHI, PIETRO.

- 2162-5. Church of S. Francisco de Paolo . . . . . *Fine Arts Academy, Florence.*

##### BONSIGNORI, FERDINANDO.

- 2166-72. Designs for a Theatre . . . . . *Fine Arts Academy, Florence.*

##### BRIGLIA, NICCOLA.

2173. Collection of Architectural details and restored Pompeian Monuments . . . . . *Artist.*

##### CACCIALLI, GIUSEPPE.

2174. Album of Architectural Works executed at the Villa of Poggio Imperiale, Florence . . . . . *Fine Arts Academy, Florence.*  
2175. Proposed Restoration of the Royal Villa of Pratolino, near Florence . . . . . *Architect.*

##### CANTONE, SIMONE.

- 2176-80. The Ducal Palace at Genoa . . . . . *Ligurian Academy.*

##### CATALANO, TRAVAGLINI, & VENERI.

2181. Restoration of the Church of Alphonzo of Arragon . . . . . *Architect.*  
2182-90. Restoration of the House of the Faun at Pompeii . . . . . *Architect.*

## DE SANTIS VINCENZO.

- 2193-98. Design for a Pantheon—Drawing . . . . . Artist.

## FERRI, GAETANO.

- 2199-2203. The Holy House of Loreto . . . . . Architect.

## GASSE, LUIGI, &amp; STEFANO.

2205. Capo di Monte Observatory, Naples . . . , *Institute of Fine Arts, Naples.*

## GIOFFREDI MARIA.

2206. Church of the Spirito Santo at Naples . . . . *Institute of Fine Arts, Naples.*

## MARSIGLI GIUSEPPE, ABBATE GIUSEPPE, &amp; ALA ANTONIO.

- 2207-12. Guache Drawings—Specimens of the Walls and  
Mosaics at Pompeii . . . . . *National Museum, Naples.*

## MARTELLI, GIUSEPPE.

- 2213-20. Designs for a Metropolitan Cathedral . . . *Fine Arts Academy, Florence.*

## MINUCCI DEL ROSSO, STEFANO.

- 2222-5. Designs for a University . . . . . *Fine Arts Academy, Florence.*

## NICCOLINI, ANTONIO.

2226. Theatre of S. Carlo, at Naples . . . . . *Institute of Fine Arts, Naples.*

## NICCOLINI, FAUSTO &amp; FELICE.

2227. A Volume of Lithochromic Plates—Monuments of  
Pompeii. . . . . *The Authors.*

## PACCAGNINI, FRANCESCO.

2228. A Terrace by the Seaside. . . . . *Fine Arts Academy, Florence.*

## PAOLETTI, GASPARE.

2229. Front of the Villa of Poggio Imperiale, Florence . . . *Fine Arts Academy, Florence.*

2230. The Leopoldine Thermæ, Montecatini, near Lucca  
(a volume) . . . . . *Fine Arts Academy, Florence.*

## POCCIANI.

2232. Public Baths . . . . . *Fine Arts Academy, Florence.*

2233. La Meridiano Wing of the Pitti Palace, at Florence. *Fine Arts Academy, Florence.*

2234. Water Reservoir (Cisternone), Leghorn . . . . *Fine Arts Academy, Florence.*

## ROSSI-MELOCCHI, COSIMO.

- 2237-9. Design for a Public Library . . . . . *Fine Arts Academy, Florence.*

## SCHIANTARELLI, POMPEO.

2240. The National Museum at Naples . . . . . *Institute of Fine Arts, Naples.*

## VALENTE, PIETRO.

2241. Acton House, Naples. . . . . *Institute of Fine Arts, Naples.*

## VANVITELLI, Sen.

- 2242-58. The Royal Palace at Caserta, Naples . . . . *H. M. the King of Italy.*

## VANVITELLI, Jun.

2259. Angri House, Naples . . . . . *Institute of Fine Arts, Naples.*

## VENERI, PASQUALE MARIA.

2260. The Tomb of King Ladislas, in the Church of S.  
Giovanni a Carbonari, at Naples . . . . . *Institute of Fine Arts, Naples.*

## SECTION II.

## B.—MODELS.

BASILI, GIOVANNI-BATTISTA, FILIPPO.

2261. The Temple of Vesta as it is . . . . . *Architect.*  
 2262. The Temple of Vesta restored . . . . . *Architect.*

CASTELLI, GIOVANNI, &amp; ABBATE, GIUSEPPE.

2263. The House of the Tragic Poet, at Pompeli . . . *National Museum, Naples.*

LA VEGA, FRANCESCO.

2264. The Theatre at Herculaneum . . . . . *National Museum, Naples.*

PADIGLIONE, FELICE.

2265. The Temple of Neptune, at Paestum . . . . . *National Museum, Naples.*  
 2266. An Ancient Tomb . . . . . *National Museum, Naples.*

## CLASS XXXVIII.

PAINTINGS IN OIL AND WATER-COLOURS,  
AND DRAWINGS.

## SECTION I.

## A.—PAINTINGS IN OIL.

AFFANNI, IGNAZIO.

2271. Jephtha's Daughter. . . . . *Artist.*

AGNENI, E.

2272. The Shades of the Great Florentine . . . . .  
 2273. Domenichino assisted by countrywomen near Rome. .

AMICONI, B.

2274. The Gleaner . . . . . *Artist.*

APPIANI, ANDREA.

2275. Olympus. . . . . *Roy. Acad. Brera.*  
 2276. Venus attiring herself (Fresco) . . . . . *Heirs of the Artist.*

APPIANI, ANDREA, JUN.

2277. Sterne's Mary. . . . . *Artist.*

## AZEGLIO, MASSIMO D'

2278. Victor Amedeus II. in Sicily . . . . . *H. M. the King of Italy.*

## BARUCCO, FELICE.

2281. H. M. King Victor Emmanuel II. . . . . *Artist.*

## BENVENUTI, PIETRO.

2282. "Suffer Little Children to come unto Me" . . . *National Gallery, Florence.*

## BERTI, GIORGIO.

2283. Peasant Woman of Sonnino . . . . . *Artist.*

2284. Odalisca . . . . . *Artist.*

## BERTINI, GIUSEPPE, &amp; BROTHERS.

2285. The Virgin and Child (Coloured Glass Window) . . . . . *Artist.*

## BISI, GIUSEPPE A.

2286. Composition Landscape . . . . . *Artist.*

## BISI, LUIGI.

2287. Interior of the Church of S. Eustorgio at Milan . . . *H. M. the King of Italy.*

## CALAMAJ, BALDASSARE.

2288. The Plague at Florence . . . . . *National Gallery, Florence.*

## CANALETTO, A. C.

2289. View of Venice . . . . . *Her Majesty.*

## CANELLA, GIUSEPPE.

2290. Landscape near Milan . . . . . *Elena-Mari Canella.*

## CATTANEO, AMANZIO.

2292. Fra Benedetto of Fojano and Clement VII. . . . . *Roy. Acad. Brera.*

## CECCHINI,

2293. A Landscape . . . . .

## CHIERICI, ALFONSO.

2294. S. Torello . . . . . *Marquis Malaspina.*

## CIANFANELLI, NICOLA.

2295. La Monaca di Monza . . . . . *Luigi Paganini.*

## CODA, NICCOLO.

- 2295A Landscape—The Landing of Garibaldi . . . . .

## D'ANTONI, ANDREA.

2296. The Judgment of Minos . . . . . *Artist.*

## DEVERS, GIUSEPPE.

2297. A Female Head, after Ary Scheffer (Enamel) . . . *City of Turin.*

## FASANOTTI, GAETANO.

2298. A Landscape on the Plains of Ticino . . . . . *Roy. Acad., Brera.*

## FERRARI, GIOVANNI BATTISTA.

2299. The Banks of the Mella . . . . . *Artist.*

## FERRARI, PIETRO.

2300. Portrait of a Gentleman . . . . . *Royal Gallery, Parma.*

2301. Portrait of a Lady . . . . . *Royal Gallery, Parma.*

## GAMBA, ENRICO.

2302. Titian's Funeral . . . . . *H. M. the King of Italy.*

## GASTALDI, ANDREA.

2303. Pietro, Micca . . . . . *City of Turin.*

## GANI, GIUSEPPE.

2304. Count Cavour . . . . . *Artist.*

## GONIN, FRANCESCO.

2305. Charles Emmanuel II. dying . . . . . *H. M. the King of Italy.*

## GONIN, GUIDO.

306. Aspiration to Heaven . . . . . *H. R. II. the Duchess of Genoa.*

## GOZZI, MARCO.

2307. Landscape, Morning . . . . . *Roy. Acad. Brera.*

## HAYEZ, FRANCESCO.

2308. The Taking of Jerusalem . . . . . *Artist.*

2309. Portrait of Madame Juva . . . . . *Signor Juva.*

2310. Portrait of the Artist . . . . . *Vincenza Hayez.*

## INDUNO, GIROLAMO.

2312. A Bivouac of Garibaldini near Capua . . . . . *Artist.*

2313. Military Ambulance in Casa Borromeo, Milan, in 1859 . . . . . *Artist.*

## LANFREDINI, ALESSANDRO.

2314. Passignano when a Child . . . . . *Tito Puliti.*

## LODI, MASSIMO.

2315. Italy Consoling Rome and Venice . . . . . *Artist.*

## MANCINELLI, GIUSEPPE.

2316. Virgin and Child . . . . . *Artist.*

2317. The Conception . . . . . *Artist.*

## MANCINI, FRANCESCO.

2318. Forest Scene—Composition . . . . . *Artist.*

## MARCHESI, LUIGI.

2319. Interior of the Sacristy of S. Giovanni, at Parma . . . . . *H. M. the King of Italy.*

2320. Interior of the Cathedral of Parma . . . . . *H. M. the King of Italy.*

2321. Church of S. Rocco, at Parma . . . . . *Professor Ferrarini, Parma.*

2322. An Ancient Chemist's Shop . . . . . *Ministry of Public Instruction.*

2323. Farm Yard . . . . . *Ministry of Public Instruction.*

## MARKO, CARLO.

2324. A Wood near the Campagna di Roma . . . . . *Artist.*

## MARINELLI, VINCENZO.

2325. An Oriental Scene . . . . . *Artist.*

## MARTINI, BIAGIO.

2326. Diogenes in his Tub . . . . . *Parma Royal Gallery.*

## MATSCHEF, CARLO.

2327. Interior of the Church of S. Maria de' Miracoli, at Venice . . . . . *Artist.*

## MORELLI, DOMENICO.

2328. The Iconoclasts . . . . . *H. M. the King of Italy.*

## MORETTO (OF BRESCIA).

2311. Two Frescos . . . . . *Martinez.*

## MUSSINI, CESARE.

2329. Marino Faliero, Doge of Venice . . . . . Artist.

## MUZZI, ANTONIO.

2342. The Revolution of Bologna . . . . . *Marquis Pepoli.*

## PALAGI, PALAGIO.

2330. Merit Rewarded, and Ignorance Unmasked . . . . . *Count Castellani.*

## PEROTTI, EDOARDO.

2331. Country Life . . . . . *Ministry of Public Instruction.*

## PESSINA, GIOVANNI.

2332. Principal Entrance of the Church of S. Ambrogio, at Milan . . . . . Artist.

## PRINETTI, CONSTANTINO.

2333. Landscape . . . . . *The Artist's Mother.*

## PRIOLO-PAOLO.

2335. Beatrice Cenci in Prison . . . . . Artist.

## PUCCINELLI, ANTONIO.

2336. A Platonic Conversation . . . . . *F. Sloane, Esq.*

## RAIMONDI, LUDOVICO.

2337. Service at the Convent of the Certosa, at Florence . . . . . Artist.

## RAPISSARDI, MICHELE.

2338. Göthe's Margaret . . . . . Artist.

## RICHARDS-GAGGIOTTI, EMMA.

2339. Madonna . . . . . Artist.

2340. The Crusade . . . . . Artist.

## RIGHINI, CAMILLO.

2341. Interior of a Sacristy . . . . . *II. II. the Prince of Piedmont.*

## ROY, PIETRO.

2343. A Hungarian Magnate . . . . . Artist.

## SALA, ELISEO.

2344. General Cima . . . . . *Heirs of General Cima.*

## SCARAMUZZA, FRANCESCO.

2345. Aminta . . . . . *Royal Academy, Parma.*

## SCATTOLA, DOMENICO.

2346. Bernard de Palissy . . . . . *Milan Artists' Society.*

## SCHIAVONI, NATALE.

2347. Innocence Asleep . . . . . *Napoleone Mariani.*

## SMARGIASSI, GABRIELE.

2348. Buonconte di Montefeltro . . . . . *H.M. the King of Italy.*

## TÒNCINI, LORENZO.

2349. The Murder of Pier Luigi Farnese . . . . . *Count Prospero Trissino*

## VANUCCI, FELICE.

2350. Fruit (8 Paintings) . . . . . Artist.

## USSI, STEFANO.

2351. The Expulsion of the Duke of Athens . . . . . *National Gallery, Florence.*

UVA<sup>^</sup>CESARE.

2352. View of Capri—Distemper . . . . . Artist.

## ZUCCHERELLI, F.

2353. A Landscape . . . . . Artist.

## ZUCCOLI, LUIGI.

2354. A Scene during the Five Days at Milan, in 1848 . . . . . Artist.

## SECTION B.

## .—PAINTINGS IN WATER COLOURS, AND DRAWINGS.

## ALOYSIO-JUVARA, TOMASO.

2355. The Presentation in the Temple (after Gerolamo Aldibrandi) . . . . . Artist.

## BOSSOLI, CARLO.

2374. Four distemper Pictures, representing the Palace of the Italian Exhibition at Florence . . . . . *H.R.H. the Prince Eugene of Savoy.*

## CALAMATTA, LUIGI.

2356. Madonna di Fuligno (after Raphael) . . . . . Artist.  
 2357. Ezekiel's Vision (after Raphael) . . . . . Artist.  
 2358. The Fornarina (after Raphael) . . . . . Artist.  
 2359. Madonna dell'Ostia (after Ingres) . . . . . Artist.

## GAZZOTTO, VINCENZO.

- 2360—2. Pen and Ink Drawings from the "Inferno," "Purgatorio," and "Paradiso" of Dante . . . . . *Sanseone d'Ancona.*

## GIGOLA, GIOVANNI BATTISTA.

2363. "The Corsair" (Byron), Illustrated with original Miniatures . . . . . *Brescia Athenæum.*  
 2365. Eugene Beauharnais (Miniature on Ivory) . . . . . *Brescia Athenæum.*  
 2366. The Temptation of St. Anthony (Miniature on Ivory) . . . . . *Brescia Athenæum.*

## JESI, SAMUELE.

2367. Hagar (after Guercino) . . . . . *Gio. Bat. Venturi.*

## ROY, PIETRO.

2368. The Corpse of Manfred, King of Sicily—Cartoon . . . . . Artist.

## TOSCHI, PAOLO.

2369. Glory—from the fresco of Correggio at Parma . . . . . *Royal Academy, Parma.*

## TRICCA, ANGELO.

2370. The Last Supper (after Raphael's painting in the Monastery of St. Onofrio) . . . . . Artist.

## VERGA, NAPOLEONE.

## MINIATURES ON PARCHMENT:—

2371. Diploma of the City of Perugia Conferring Nobility on Marquis Pepoli . . . . . Artist.  
 2372. Similar Diploma from the City of Terni . . . . . Artist.  
 2373. Twelve Miniatures:—Philosophers and Literary Men Allegorical Figures . . . . . Artist.

## CLASS XXXIX.

SCULPTURE, MODELS, DIE-SINKING, AND  
INTAGLIOS.

## CANOVA, ANTONIO.

2378. Marble Statue—Venus . . . . . *Mr. Henry Hope.*  
 2379. Marble Bust—Napoleon . . . . . *Duke of Devonshire.*  
 2380. Marble Bust—Madame Letizia . . . . . *Duke of Devonshire.*

## ALBERTONI, GIOVANNI.

2381. Marble Statue—Nymph of Diana . . . . . *Artist.*  
 2382. Marble Bust—H.M. King Victor Emmanuel . . . . . *Artist.*

## ANGELINI, TITO.

2383. Marble Statue—Eve . . . . . *Comte de Fleurien.*

## ANTONINI, GIUSEPPE.

2384. Crucifix (Ivory) . . . . . *Artist.*  
 2385. Crucifix, with the Virgin Mary and St. John . . . . . *Artist.*

## ARGENTI, GIOSUE.

2386. Marble Statue—The Christian Martyr . . . . . *Artist.*

## BARBERA, ROSOLINO.

2387. Marble Statue—Diogenes . . . . . *Artist.*

## BARTOLINI, LORENZO.

2388. Marble Bust—Lord Byron . . . . . *Mr. Pillans.*  
 „ Marble Bust—Countess Guiccioli . . . . . *Artist.*

## BERNASCONI, PIETRO.

2390. Marble Bust—Prayer . . . . . *Artist.*

## BEZZI, A.

- 2391.—95. Ten small Terra-Cotta Statues . . . . . *Artist.*

## BIANCHI, ACHILLE.

2396. Marble Statuette—Alpinolo (from Cantu's Novel,  
 "Margherita Pusterla" . . . . . *Artist.*

## BOTTINELLI, ANTONIO.

2398. Marble Statue—Camilla . . . . . *Artist.*

## BUZZI-LEONE, LUIGI.

2399. Plaster Bas-relief—The Flight into Egypt . . . . . *Artist.*

## CALI, ANTONIO.

2400. Plaster Statue—The Pugilist . . . . . *Artist.*

## CALI, GENNARO.

2401. Marble Group—Pietà . . . . . *City of Naples.*

## COCCHI, POMPEO.

2403. Marble Statuette—The Betrothed of One of the Thousand . . . . . Artist.

## CORBELLINI, QUINTILIO.

2404. Marble Statue—Bashfulness . . . . . Artist.

## CORTI, COSTANTIO.

2405. Plaster Statue—Satan . . . . . Artist.

## COSTA, PIETRO.

2406. Marble Statue—L'Indiana . . . . . Artist.

## CRICA, PASQUALE.

2407. Marble Group—A Cock Fighting with Snakes . . . . . Artist.

## CROFF, GUISEPPE.

2408. Marble Statue—Prometheus . . . . . Artist.

## DAL NEGRO, PIETRO.

2409. Marble Statuette—Eve before the Fall . . . . . Artist.

2410. Colossal Marble Bust—Italy . . . . . Artist.

## DELISI, BENEDETTO.

2411. Plaster Statue—The Brazen Serpent . . . . . *The Italian Government.*

## FANTACCHIOTTI, EDOARDO.

2458. Musidora—An Infant Sleeping with a Dog (Innocence) . . . . . Artist.

## FULLER, CHARLES.

2418. Equestrian Statue in Plaster—Lady Godiva . . . . . Artist.

2419. Bronze Statue—Shipwrecked Man . . . . . Artist.  
(Cast by Clementi Papi).

## FUMEO, PIETRO.

2420. Marble Bust—Napoleon when First Consul . . . . . Artist.

## FUNAJOLI, L. ALBINO.

- 2420A. Eleven Alibaster Bassi Rilievi (Portraits) . . . . . Artist.

## GALLETTI, STEFANO.

2421. Marble Bas-relief—Ezekiel Raising the Dead . . . . . Artist.

## GANI, VINCENZO.

2422. Marble Bust—Count Cavour . . . . . Artist.

## JORINI, LUIGI

2424. Marble Bust—Our Saviour . . . . . Artist.

## MAGNI, PIETRO.

2426. Marble Statue—Socrates in the Theatre of Athens . . . . . Artist.

2427. Marble Statue—Angelica . . . . . Artist.

2428. Marble Statue—A Girl Reading . . . . . *Ministry of Public Instruction.*

## MANFREDINI, GAETANO.

2429. Marble Group—Children Playing . . . . . *Giuseppe Somaini.*

## MOLLI, GIOVANNI.

2430. Terra Cotta Group—The Farnese Bull . . . . . Artist.  
 2431. 1—8. Statuettes in Terra Cotta . . . . . Artist.

## MONTI, R.

2376. The Sleep of Sorrow and the Dream of Joy . . . . . Artist.  
 2377. A Georgian Lady of the Harem . . . . . Artist.

## PAMPALONI, L.

2459. The Penitent Magdalen . . . . . T. Du Boulay, Esq.

## PANDIANI, ADELAIDE.

2432. Marble Bust—S. Mary Magdalen . . . . . Artist.

## PANDIANI, GIOVANNI.

2433. Marble Statue—Garibaldi . . . . . Artist.

## PARMA NATIONAL LIBRARY.

2434. Type—Roman Text (No. 6, *Tondo Catania*)\*  
 " Roman Capitals (Nos. 53, 83, 94).  
 " Palesfine Italics (No. 5, *Corsico Fuligno*).  
 " Greek Text (No. 21).  
 " Greek Capitals (Nos. 17, 28).

\* Words within brackets refer to the nomenclature given in the *Manuale Bodoniano*.  
 Thompson's Seasons. 1 vol. folio, parchment. *Parma*, printed by Bodoni, 1794.  
 ΤΡΥΦΙΟΔΟΤΟΙ ΙΔΙΟΥ ΑΔΩΞΙΣ. *Parma*, in *Ædibus Palatinis*, 1796; *Typis Bodonianis*. Small folio, printed on silk.

## PELLOLI, ANTONIO.

2435. Marble Group—A Cock Fight . . . . . Artist.

## PIEROTTI, GIUSEPPE.

2436. Marble Statue—An Indian Hunter . . . . . Artist

## RONCATI, EDOARDO.

2437. Marble Statue—Cleopatra Dying . . . . . Artist.

## REVELLI, SALVATORE.

2438. Plaster Bas-relief—The Descent from the Cross . . . . . Ligurian Academy.

## RICCA, PASQUALE.

2439. Marble Statue—St. Jerome . . . . . Artist.

## ROMANELLI, PASQUALE.

2444. Plaster Statue—Garibaldi . . . . . Artist.  
 2445. Marble Statue—Franklin when a Child . . . . . Artist.

## SALVINI, SALVINO.

2446. Marble Statue—The Daughter of Zion . . . . . Artist.

## SANGIORGIO, ABBONDIO.

2447. Marble Statue—Eve . . . . . Artist.

## SELERONI, GIOVANNI.

2448. Marble Statue—Resignation . . . . . Artist.

## SPAVENTI, FILIPPO.

2449. Marble Statue—Innocence. . . . . Artist.  
 2450. Marble Statue—The Desolate One . . . . . Artist.

## STRAZZA, GIOVANNI.

2451. Marble Statue—The Bride . . . . . *H. M. the King of Italy*

## TANTARDINI, ANTONIO.

2452. Colossal Plaster Statue—Moses . . . . . Artist.  
 2453. Marble Statue—Pining for Home . . . . . Artist.  
 2454. Marble Statue—The Bather . . . . . *Adelaide Ristori.*

## TARI, GIUSEPPE.

2455. Lava, Bas-relief on—St. Peter and St. Paul . . . . . Artist.

## TENERANI, PIETRO.

2462. Marble Statue—Psyche . . . . . *Hon. P. Calihorpe.*

## VELA, VINCENZO.

2456. Marble Statue—Morning Prayer . . . . . *Count Giulio Lillo.*

## MAROCCHETTI.

2460. Bronze Group—Love, with a Dog . . . . . Artist.  
 „ Plaster Statue—Sir Jamsetjee Jejeebhoy . . . . . Artist.

## VILLA, IGNAZIO.

2463. Marble Group—Hagar and Ishmael . . . . . Artist.  
 2464. Marble Statue—Hero expecting Leander . . . . . Artist.  
 2464A. Marble Bust—Faith . . . . . Artist.

# CLASS XL.

## ETCHINGS AND ENGRAVINGS.

### ALOYSIO, JUVARA.

2465.	Portrait of Pius IX.	. . . . .	Artist.
2466.	Portrait of Marquis Santangelo.	. . . . .	Artist.
2467.	Portrait of General Filangieri	. . . . .	Artist.
2468.	Portraits of Rubens and Vandyke	. . . . .	Artist.
2469.	Portrait of Rembrandt	. . . . .	Artist.

### ANDERLONI, PIETRO.

2470.	The Woman taken in Adultery	Titian	Royal Acad. Brera.
2471.	Moses	Poussin	Royal Acad. Brera.

### BARTOLOZZI, FRANCESCO.

2472.	The Circumcision	. . . . .	Guercino	. . . . .	Cornaghi, Scott, & Co.
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### BOLOGNA, ARCHIGINNASIO DI.

2473.	Ten Engravings	. . . . .	. . . . .	. . . . .	Archiginnasio.
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### CALAMATTA, LUIGI.

2474.	La Gioconda	. . . . .	L. da Vinci	. . . . .	Artist.
2475.	Francesca da Rimini	. . . . .	Ary Scheffer	. . . . .	Artist.
2476.	Portrait of Rubens	. . . . .	Rubens	. . . . .	Artist.
2477.	Madonna della Seggiola	. . . . .	Raphael	. . . . .	Artist.
2478.	The Vow of Louis XIII.	. . . . .	Ingres	. . . . .	Artist.
2479.	Portrait of Georges Sand	. . . . .	Calamatta	. . . . .	Artist.
2480.	Portrait of L'Abbé Lamennais	. . . . .	Calamatta	. . . . .	Artist.

### CHIOSSONE, DOMENICO.

2481.	L'Italia Artistica—A Book of Engravings.	. . . . .	. . . . .	. . . . .	Artist.
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### CHIOSSINE, EDOARDO.

2482.	Bread and Tears	. . . . .	D. Induno	. . . . .	Artist.
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### FOSELLA, GIOVANNI.

2485.	Madonna del Baldacchino	. . . . .	. . . . .	. . . . .	Artist.
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### GARAVAGLIA, GIOVITA.

2486.	The Meeting of Rachel and Jacob	. . . . .	Appiani	. . . . .	Royal Acad Brera.
2487.	Madonna della Seggiola	. . . . .	Raphael	. . . . .	G. Vaughan, Esq.

### JESI, SAMUELE.

2488.	Hagar	. . . . .	Guercino	. . . . .	Sig. G. B. Venturi.
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### LAUROGOS TINO.

2489.	A Study of Trees	. . . . .	. . . . .	. . . . .	Artist.
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## LONGHI, GIUSEPPE.

2490.	Lo Sposalizio . . . . .	Raphael . . .	<i>Royal Acad. Brera.</i>
2491.	The Decollation of St. John Baptist . . . . .	G. Dow . . .	<i>G. Vaughan, Esq.</i>
2492.	The Entombment . . . . .	D. Crespi . . .	<i>Royal Acad. Brera.</i>
2493.	Portrait . . . . .	. . . . .	<i>Royal Acad. Brera.</i>
2494.	Portrait . . . . .	. . . . .	<i>Royal Acad. Brera.</i>

## MORGHEN, RAPHAEL.

2495.	The Last Supper . . . . .	L. Da Vinci . . .	<i>Royal Acad. Brera.</i>
2496.	Madonna del Sacco . . . . .	A. del Sarto . . .	<i>Royal Acad. Brera.</i>
2497.	Marquis Moncada . . . . .	Vandyke . . .	<i>Royal Acad. Brera.</i>
2498.	Madonna della Seggiola . . . . .	Raphael . . .	<i>Royal Acad. Brera.</i>
2499.	Portrait of Tasso . . . . .	. . . . .	<i>Royal Acad. Brera.</i>
2500.	Portrait of George Jonas . . . . .	. . . . .	<i>Royal Acad. Brera.</i>
2501.	Portrait of Lady Hamilton, as Thalia . . . . .	. . . . .	<i>Royal Acad. Brera.</i>

## PAGLIANO, E.

2500.	Count Cavour . . . . .	. . . . .	<i>Artist.</i>
2501.	A Dying Woman . . . . .	. . . . .	<i>Artist.</i>

## PORPORATI.

2502.	Venus and Cupid . . . . .	P. Battoni . . .	<i>R. Buckner, Esq.</i>
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## RICCIANI, ANTONIO.

2506.	The Death of Priam . . . . .	Benvenuti . . .	<i>Naples Ins. of Fine Arts.</i>
2507.	Judith . . . . .	. . . . .	<i>Naples Ins. of Fine Arts.</i>

## RIMINI, ABRAMO.

2508.	David . . . . .	Guercini . . .	<i>Artist.</i>
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## ROSASPINA, FRANCESCO.

2509.	A Dance of Cupids . . . . .	Albana . . .	<i>Royal Acad. Brera.</i>
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## SABATELLI, LUIGI.

2510.	The Plague at Florence (Etchings) . . . . .	. . . . .	<i>Royal Acad. Brera.</i>
2511.	The Revelations (1—6 Etchings) . . . . .	. . . . .	<i>Sons of the Artist.</i>

## SCHIAVONE.

2512.	The Assumption of the Virgin . . . . .	Titian . . .	<i>G. Vaughan, Esq.</i>
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## SALVANI, FERDINANDO.

2513.	Christ in the Garden . . . . .	Delaroche . . .	<i>Artist.</i>
2514.	Christ Comforted by Angels . . . . .	. . . . .	<i>Artist.</i>

## SIVALLI, LUIGI.

2515.	St. Jerome . . . . .	Correggio . . .	<i>Artist.</i>
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## TOSCHI, PAOLO.

2516.	Lo Spasimo di Sicilia . . . . .	Raphael . . .	<i>G. Vaughan, Esq.</i>
2517.	The Descent from the Cross . . . . .	D. di Volterra . . .	<i>G. Vaughan, Esq.</i>
2518.	St. John with St. Augustin . . . . .	Correggio . . .	<i>Colnaghi, Scott, &amp; Co.</i>
2519.	Two Angels . . . . .	Correggio . . .	<i>Colnaghi, Scott, &amp; Co.</i>
2520.	Madonna della Scala . . . . .	Correggio . . .	<i>Colnaghi, Scott, &amp; Co.</i>
2521.	Diana . . . . .	Correggio . . .	<i>Colnaghi, Scott, &amp; Co.</i>
2522.	The Deposition . . . . .	A. Canova . . .	<i>Colnaghi, Scott, &amp; Co.</i>
2523.	SS. Lucia and Apollonia . . . . .	Parmegiano . . .	<i>Colnaghi, Scott, &amp; Co.</i>
2524.	H. M. Charles Albert . . . . .	H. Vernet . . .	<i>Colnaghi, Scott, &amp; Co.</i>

## TRICCA, ANGIOLO.

2503.	A Portrait . . . . .	. . . . .	<i>Artist.</i>
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## VOLPATO, GIOVANNI.

2525.	Nox	.	.	.	.	.	.	Guercino	.	.	<i>G. Vaughan, Esq.</i>
2526.	Lucifer	.	.	.	.	.	.	Guercino	.	.	<i>G. Vaughan, Esq.</i>
2527.	The Entombment	.	.	.	.	.	.	Raphael	.	.	<i>Colnaghi, Scott, &amp; Co.</i>

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## LITHOGRAPHS.

## FANOLI, MICHELE, MILAN.

2528.	The three Maries	.	.	.	.	.	.	Landelle	.	.	.	<i>Artist.</i>
2529.	Will of the Wisp	.	.	.	.	.	.	Gendron	.	.	.	<i>Artist.</i>
2530.	Orpheus	.	.	.	.	.	.	Jalabert	.	.	.	<i>Artist.</i>
2531.	Origin of the Regattas at Venice	.	.	.	.	.	.	.	.	.	.	<i>Artist.</i>

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## CHROMO-LITHOGRAPHS.

## BORZINO.

532.	1-4. Various subjects	.	.	.	.	.	.	.	.	.	.	<i>Artist.</i>
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# CONTENTS.

	PAGE
Commission, Royal Italian ... ..	ix.
Commissioners, Royal Italian, in London ... ..	x.
Jurors, Italian ... ..	xi.
Commissioners, Special, for various Departments ... ..	xiv.
Sub-Committees ... ..	xvii.
Catalogue, Commission for Compiling ... ..	"
Medals and Honourable Mentions ... ..	xviii.
Index to Exhibitors... ..	xxxix.

CLASS I.—Mineral and Metallurgical Products ... ..	1
Introductory Remarks ... ..	"
SECTION I.—Minerals, Rocks, and Fossils of General or Local Scientific Interest, Geological Maps ... ..	2
SECTION II.—Metallic Minerals, Metallurgical Processes, Mines, and Mining Maps ... ..	6
<u>A. General Scientific and Industrial Collections</u> ... ..	"
<u>B. Collections of Special Mining and Metallurgical Products</u> ... ..	12
§ 1. Iron ... ..	"
§ 2. Iron Pyrites ... ..	20
§ 3. Copper ... ..	"
§ 4. Lead and Silver ... ..	29
§ 5. Gold ... ..	34
§ 6. Nickel ... ..	35
§ 7. Antimony ... ..	"
§ 8. Mercury ... ..	36
§ 9. Manganese ... ..	37
SECTION III.—Sulphur ... ..	38
SECTION IV.—Mineral Fuels ... ..	40
1. Graphite ... ..	42
2. Anthracite ... ..	"
3. Lignite ... ..	"
4. Peat and Turf ... ..	43
SECTION V.—Stone and Marble Quarries ... ..	44
§ 1. Marbles ... ..	"
<u>White Marbles</u> ... ..	45
Coloured Marbles ... ..	47
<u>Marble Trades of Italy, Remarks on the</u> ... ..	49
§ 2. Lithographic Stones ... ..	56
§ 3. Alabaster ... ..	"
§ 4. Hard Stones ... ..	58

	Page.
§ 5. Serpentine and Ophiolitic Stones ... ..	59
§ 6. Granites and Felspathic Rocks ... ..	60
§ 7. Schistose Rocks ... ..	61
§ 8. Limestones ... ..	62
§ 9. Sandstones ... ..	"
§ 10. Millstones, Whetstones, Sand Special Collections ... ..	63
§ 11. Clay and Refractory Substances ... ..	68
§ 12. Earthy Colouring Matters ... ..	69
§ 13. Marls and other Mineral Fertilisers ... ..	"

CLASS II.—Chemical Substances and Products, and Pharmaceutical Processes ... 70

Introductory Remarks ... ..	"
§ 1. Chemical Products proper ... ..	71
§ 2. Salt (Chloride of Sodium) ... ..	74
§ 3. Mineral Waters ... ..	75
§ 4. Pharmaceutical Preparations, Essences, and Perfumery... ..	79

CLASS III.—Substances used for Food, &c. ... 81

SECTION I.—Agricultural Products ... ..	"
Introductory Remarks ... ..	"
§ 1. Cereals ... ..	83
Wheat ... ..	"
Barley, Rye, Oats, &c. ... ..	84
Maize or Indian Corn ... ..	"
Italian Millet, Common Millet, Sorgho, &c. ... ..	85
Rice ... ..	"
Analysis of various kinds of Italian Grain and Flour ... ..	87
Special Collections ... ..	88
§ 2. Vegetables ... ..	103
Analysis of various Vegetables ... ..	105
§ 3. Fodder and Grain used as Fodder ... ..	107
§ 4. Dried Fruits ... ..	"
SECTION II.—Articles suitable for Food, preserved or otherwise ... ..	109
§ 1. Flour ... ..	"
Italian Paste, Bread, Biscuits ... ..	111
§ 2. Meat, Fish, Vegetables, salted or preserved ... ..	113
§ 3. Cheese and Butter ... ..	117
§ 4. Sugars ... ..	120
§ 5. Confectionery, Syrups ... ..	"
§ 6. Honey ... ..	121
SECTION III.—Wines, Liqueurs, Tobacco, &c. ... ..	122
§ 1. Wine ... ..	"
Analysis of Italian Wines ... ..	124
Beer ... ..	146
Alcohol and Alcoholic Liqueurs ... ..	147
Vinegar ... ..	149
§ 2. Tobacco... ..	150

CLASS IV.—Animal and Vegetable Substances used in Manufactures ... 153

SECTION I.—Vegetable Kingdom ... ..	"
Introductory Remarks ... ..	"
§ 1. Gum, Resin, Manna ... ..	155
§ 2. Oils ... ..	156
Olive Oil ... ..	"
Oleaginous Seeds and Various Oils ... ..	162
Soaps ... ..	164
§ 3. Dyeing Substances ... ..	165

	PAGE.
§ 4. Tanning Substances ... ..	167
§ 5. Textile Substances ... ..	168
Cotton ... ..	169
Catalogue of the Collection of Cotton made by the Royal Italian Commission ... ..	170
§ 6. Timber suitable for Building Purposes, Cabinet-makers, Bark, &c. ...	176
§ 7. Plants for Various Industrial Purposes ... ..	179
§ 8. Herbariums ... ..	181
SECTION II.—Animal Kingdom ... ..	182
§ 1. Wool ... ..	183
§ 2. Silk Cocoons and Horse-hair ... ..	183
§ 3. Fat, Wax, Stearine ... ..	184
§ 4. Glue, Albumen, Coral, and Miscellaneous Articles ... ..	185
CLASS V.—Railway Plant, including Locomotive Engines and Carriages... ..	187
Table of Italian Railways, constructed and in course of construction ...	191
CLASS VI.—Carriages not connected with Rail or Tramroads ... ..	198
CLASS VII.—Manufacturing Machines and Tools ... ..	202
SECTION I.—Machinery employed in Spinning and Weaving ... ..	202
SECTION II.—Machines and Tools used in Various Works... ..	202
CLASS VIII.—Machinery in general ... ..	204
CLASS IX.—Agricultural and Horticultural Machines and Implements ... ..	209
CLASS X.—Civil Engineering, Architectural and Building Contrivances... ..	214
SECTION I.—Works of Civil Engineering ... ..	217
§ 1. Triangulations, Drawings, Plans, Maritime Constructions, &c. ...	217
§ 2. Materials for Building ... ..	221
SECTION II.—Sanitary Arrangements in Public and Private Buildings ...	221
SECTION III.—Articles for House Decoration ... ..	221
CLASS XI.—Military Engineering, Armour and Accoutrements, Ordnance and Small Arms ... ..	224
SECTION I, II.—Clothing and Military Equipments ... ..	226
SECTION III.—Weapons ... ..	226
CLASS XII.—Naval Architecture, Ships' Tackle ... ..	229
CLASS XIII.—Philosophical Instruments ... ..	230
CLASS XIV.—Photography and Photographic Apparatus ... ..	233
CLASS XV.—Horological Instruments ... ..	234
CLASS XVI.—Musical Instruments... ..	235
CLASS XVII.—Surgical Instruments and Appliances ... ..	236
CLASS XVIII.—Cotton ... ..	239
§ 1. Cotton Spinning ... ..	240
§ 2. Cotton Weaving ... ..	241
§ 3. Dyeing, Pressing, and Printing ... ..	241
CLASS XIX.—Flax and Hemp ... ..	244
SECTION I.—Cultivation of Hemp ... ..	245
SECTION II.—Hemp Manufacture ... ..	250
SECTION III.—Flax ... ..	254

	PAGE.
CLASS XX.—Silk and Velvet ... ..	257
Introductory Remarks ... ..	"
CLASS XXI., XXII., XXIII.—Woollen and Worsted ... ..	272
§ 1. Spun Wool ... ..	274
§ 2. Tissues, Carpets, &c. ... ..	"
CLASS XXIV.—Tapestry, Laces, and Embroidery ... ..	277
CLASS XXV.—Skins, Fur, Leather, and Hair ... ..	280
CLASS XXVI.—Leather, including Saddlery and Harness ... ..	281
Introductory Remarks ... ..	"
§ 1. On Tanning, and the Materials used therein ... ..	"
§ 2. Substances used in Tanning ... ..	282
§ 3. Colouring Matters ... ..	283
§ 4. Leather, and Articles of Leather ... ..	285
§ 5. Varnished Skins and Morocco Leather ... ..	"
§ 6. Tanned Skins and Chamois Leather ... ..	286
CLASS XXVII.—Articles of Clothing ... ..	290
CLASS XXVIII.—Paper, Stationery, Printing, and Bookbinding ... ..	294
SECTION I.—Paper and Papeterie ... ..	296
SECTION II.—Printing, Calcography, Lithography ... ..	297
CLASS XXIX.—Educational Works and Appliances ... ..	303
SECTION I.—Books and Educational Apparatus in General ... ..	"
SECTION II.—Charitable and Educational Institutions ... ..	315
SECTION III.—Colleges and Boarding Schools ... ..	319
SECTION IV.—Schools and Colleges ... ..	320
SECTION V.—Universities, Museums of Natural History, Technical Institutions ... ..	323
SECTION VI.—Public Libraries and Archives ... ..	327
§ 1. Public Libraries ... ..	"
§ 2. Archives ... ..	329
SECTION VII.—Historical and Fine Art Museum ... ..	333
CLASS XXX.—Furniture and Upholstery, including Paper-Hanging and General Decoration ... ..	335
§ 1. Inlaid Stone Work ... ..	"
§ 2. Objects of Furniture and Decoration in Venetian Glass, Mosaic, in Imitation of Aventurine, Chalcedony, and other Stones ... ..	336
§ 3. Articles of Furniture for Ornament and Decoration, in Alabaster, Marble, and Serpentine ... ..	338
§ 4. Articles and Ornamental Furniture, carved in Wood and Ivory ... ..	339
§ 5. Furniture in Marqueterie, Japan, &c. ... ..	341
CLASS XXXI. and XXXII.—Iron and General Hardware ... ..	345
Introductory Remarks ... ..	345
CLASS XXXIII.—Work in Precious Metals, and their Imitation, Jewellery, Articles of Virtu, &c. ... ..	352
Introductory Remarks ... ..	352
§ 1. Jewellery ... ..	353
§ 2. Coral, Marqueterie in Tortoiseshell, and Precious Metals ... ..	355
§ 3. Medals and Coins... ..	356
CLASS XXXIV.—Glass ... ..	358
Introductory Remarks ... ..	358

	PAGE.
CLASS XXXV.—Pottery ... ..	360
Introductory Remarks ... ..	360
§ 1. Terra Cotta, Common Pottery ... ..	360
English Earthenware and fine Stoneware ... ..	361
Earthenware ... ..	361
Porcelain ... ..	362
CLASS XXXVI.—Dressing Cases, Despatch Boxes, and Articles used in Travelling...	363
CLASS XXXVII.—Architectural Designs and Models ... ..	364
CLASS XXXVIII.—Paintings in Oil and Watercolours and Drawings ... ..	366
SECTION I.—A. Paintings in Oil ... ..	366
SECTION II.—B. Paintings in Watercolours and Drawings ... ..	370
CLASS XXXIX.—Sculpture, Models, Die-sinking, and Intaglios ... ..	371
CLASS XL.—Etchings and Engravings ... ..	375
Lithographs ... ..	377
Chromo-Lithographs ... ..	377



